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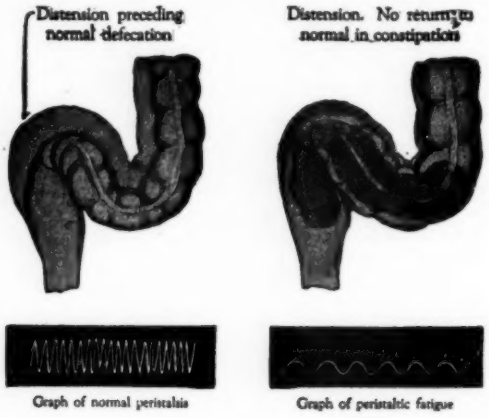
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The Glands of Internal Secretion*

Relationship of the Endocrine Glands, Especially the Gonads, to Disease.

H. LYONS HUNT, M. D., L. R. C. S., L. R. C. P. Edin., L. F. P. & S. Glasgow

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That the internal secretions play an important rôle in the genesis of numerous disorders, in addition to the well recognized endocrinopathies, is today a well established fact.

Time was and not so very long ago, when our knowledge of matters *metabolic* was very rudimentary. Williams recalls the fact that tissue change was regarded partly as a nervous phenomenon, but mainly as a dietetic drama, in which a harmless enough thing called uric acid very successfully posed as the villain.

Today we know more. We know that metabolism is under the direct control of the internal secretory glands. We know that these glands preside over growth and development in infancy and childhood, that they are essential to mental, physical and reproductive efficiency in adult life, and that they are responsible for the maintenance of cabatolic balance in the period of decline.

It is therefore no exaggeration to define the constitution of an individual as the resultant of his internal secretions, or to speak of the glands as "making up the personality."

The thesis has been put forward that the phenomena of senescence are due to the decline in the activities of the thyroid gland. This, of course, does not mean that old age itself is due to a failure of the thyroid, but it has been contended that many of the disagreeable and disabling concomitants of old age can be directly traced to this cause.

Some of these concomitants have been compared with the symptoms of myxedema. The asthenic state of the skin and its appendages, the subnormal temperature, both subjective and objective, the muscular weakness, the failure of memory and the difficulty of mental concentration, the affections of the gums and the disorganization of the teeth, the rheumatic pains, the constipation, and the tendency to vascular degeneration are all salient features both of myxedema and senility, and present a series of similarities which can scarcely be dismissed as fortuitous.

Leonard Williams thinks this is an unduly restricted view of the matter, for it is quite certain that in common with the thyroid, all the endocrine glands, notably the *gonads,* the suprarenals, the pituitary, and the pancreas, undergo anatomical changes which seriously impair the functional activities.

The phenomena of old age are therefore due to a general lowering of endocrine activity and not to the failure of one gland only, important though that one gland admittedly is. There can, for example, be no doubt that the testicular decline is an important factor in the production of some of these phenomena. Furthermore, that there is a certain competitive activity between the internal secretion of the ovary and that of the thyroid is well established, and the observed facts go far to prove that the activity of the ovary normally provokes a corresponding activity on the part of the thyroid.

The clinical evidence of this is provided by the enlargement of the thyroid observed in the majority of women at each menstrual period. It is obvious then that, given a girl with a congenitally inadequate thyroid, the advent of menstruation will serve to emphasize that inadequacy, and thus bring into view various symptoms which up to that time had lain dormant.

The author has observed in numerous instances of ovarian transplantation a marked stimulation of thyroidal function, such as stimulation of memory, increase in concentration, disappearance of rheumatic pains, stimulation of intestinal peristalsis, and rapid decrease of an

abnormal blood pressure. These changes following ovarian transplantation have occurred with such regularity, that it has been a matter of debate in the author's mind, whether these changes were due to indirect thyroid stimulation or to the ovarian secretion itself.

We are today facing various theories on the subject of internal secretions, their effect on metabolism, and their relation to mental perversions.

Physiologists and anatomists, chemists and laboratory workers have delved deeply into the functions and anatomical structure of the ductless glands and brought to the surface a knowledge of their bearing on metabolism and mental activities.

On the ground of these findings and his own experiences, Keister points to the direct communication between the sympathetic nervous system and the ductless glands, which explains why these organs with their secretions become influenced by mental emotion either of anger or distress. Many cases of *melancholy* and *hypochondriasis* are caused by derangement of the internal secretions. There are also mental perversions, lack of control of the sexual passions, and anger. There is paranoia, religious emotionalism, hysteria and various other forms of mental depravity which must be regarded as pathological effects of abnormal internal secretions.

Then there are the various kinds of *faulty metabolism* that give rise to the purin bodies such as uric acid, xanthin, guanin. We also have the toxins that are set free and invade the entire system when the ductless glands become impaired, causing various forms of mental perversions.

As a result of the deficiency of the nucleins, the catabolic phase of metabolism is impaired, and with toxic waste accumulating in the blood, including that which circulates in the brain cells, catatonic phenomena are invited.

Keister calls attention to the fact that in a postmortem study of eight patients suffering from *dementia praecox*, all of whom died of tuberculosis, Dercum and Ellis found that in seven the thyroid was under weight. The other seven glands showed colloid abnormalities, both quantitative and qualitative, and four showed retrograde changes in the acinal epithelial cells. The adrenals showed a marked excess in weight.

Keister quotes Sajous, who states that 65 per cent of all idiots, before the age of six years, are deprived of the thymus gland. This class is more susceptible to infectious diseases, and about the same percentage succumb to these infections. Many die of *tuberculosis*.

When we have a suppression or stagnation of the secretions of any one or all of the ductless glands, we may have a state of *degeneracy of both mind and body*. There may be amentia, ranging from the slight backwardness of the moron or imbecile to profound idiocy, including the amaurotic, moral, and microcephalic forms.

In order to demonstrate the frequency of ductless gland disorders as compared with diseases of other systems of the body, Engelbach quotes thirteen cases from his personal experience. One case was a girl, ten years of age, weighing 205 pounds. *Adiposity* began early in life and gradually increased. There was the classical girdle adiposity, so characteristic of posterior lobe insufficiency. The fact which Engelbach wants to emphasize in this case is that this girl probably will not mature correctly when she reaches the adolescent stage. This will produce a great many secondary symptoms referable to her nervous, cardiovascular and gastro-intestinal system. Many such cases are treated as primary lesions, whereas the actual cause of the condition is the lack of ovarian function, which is primarily due to an insufficiency of the anterior lobe of the pituitary gland. For this reason it ought to be emphasized that juvenile adiposity is really the danger signal that indicates the probability of lack of genital growth and function, with its consequences in the postadolescent age.

At this point the author would call attention to the fact that adiposity of middle life so frequently runs parallel to the degeneration of ovarian tissue, that the only conclusion that one can draw is that this adiposity is a direct result of the changes taking place in the ovary. The author wishes to state the case of a patient forty-six years of age, wife of a physician, mother of one child; began menstruating at the age of twenty-two, discontinued menstruating at forty-three, weighed 150 pounds, upper part of the body very slender, hips, thighs and legs very large. Sheep's ovary was transplanted three years after menstruation discontinued. Three months after the operation, patient again began to menstruate. Measurements showed seven inches less around the hips, although there was no loss of general body weight, patient still weighing 150.

In addition to this secondary *gonad insufficiency due to anterior lobe pituitary deficiency*, there is added to the majority of these cases which have had a bilobar pituitary insufficiency for a number of years, an insufficiency of the thyroid gland, which complicates the condition very considerably and adds untold difficulties to its relief by treatment.

In these conditions where we have a thyroid insufficiency added to a primary pituitary insufficiency, we do not get an abnormal metabolic rate, which has misled a great many observers. Experience based on the routine examination of about 2500 endocrine disorders, 875 of which were pluriglandular, suggested that the basal metabolic rate is not a guide to the function of the thyroid gland in pluriglandular disorders. This rate might be within the normal, and yet the thyroid gland may be either very much decreased or increased in its function. While the author has a great deal of confidence in the basal metabolic rate as a measure of thyroid function in simple uniglandular thyroid disorder, it is his opinion that the above statement maintains in all those conditions in which the thyroid disorder is only a part of a pluriglandular dyscrasia.

This has been proved by the remarkable therapeutic responses to thyroid substitution in these pluriglandular disorders having a normal or even metabolic rate.

Engelbach has collected a series of cases of women with primary anterior lobe insufficiency. The subjects were of various ages, from fifteen to forty years. There was complete *amenorrhea*, the genital organs in an infantile state with regard to development, with complete absence of function. Besides longer or shorter periods of amenorrhea present in these cases, other aberrant forms of anterior lobe insufficiency have various types of menstrual imperfection, such as marked *dysmenorrhea, metrorrhagia*, and various combinations of these menstrual disorders.

Answering Engelbach, the author would refer the reader to his article published in the *New York State Journal of Medicine*, December, 1923:—Case No. 1, a woman, thirty-nine years of age, who from the age of fourteen menstruated irregularly with such pain that she was given chloroform, ether or morphine at menstrual periods. Examination showed infantile genital organs. The hips were undeveloped, while the legs and arms were like those of a girl under the age of fourteen. Following ovarian transplantation, menstruation came and went for a period of over one year without any sign or symptom of general pain or unusual menstrual distress.

After all, the hypoplasia of the genital organs is

* This is the fourth article of this series.

very much more important than the deformity caused by the adiposity subsequent to the insufficiency of the posterior lobe of this gland. The adiposity, at least, does not produce very marked changes, reflex or hormonic, in other systems; whereas an imperfect generative function disturbs the economy of the whole body, including the important functions of the cardiovascular, nervous and gastro-intestinal systems.

What connection exists between the endocrine glands and *sterility?* Pottenger contends that sterility in women cannot be adequately discussed from the anatomical basis alone. While inflammatory disease of the ovaries, tubes and uterus and mechanical interference with conception often exists, there is still a group of sterile women who do not respond to any of the measures applied for the relief of their sterility, because the cause is functional and not anatomical.

To understand this, we must have a comprehensive knowledge of the fundamental physiological factors governing the development of sex glands and their function. While the production of the ovum and the reception and retention of it in the uterus when fecundated are essential to successful impregnation, the factors which control impregnation are many and are connected with various portions of the vegetative systems.

Whether or not a woman shall be able to bear children is not determined alone by the possession of ovaries, tubes and a uterus, but upon the question whether these organs are able to function normally. This presupposes a normal development and the maintenance of normal sexual function.

The development of the female sexual organs as well as of the female secondary sexual characteristics depends upon the endocrine glands.

There cannot be normal sexual development and normal sex function without the incretions from the thyroid and pituitary and other incretions. Genital function is stimulated by ovarian, thyroid, pituitary and suprarenal secretions.

The ovary is a very constant factor in a certain group of cases of sterility. Ovulation may not take place, but it often takes place when menstruation is absent. This is proved by cases of *pregnancy during lactation.*

Several years ago the author was consulted by a man in his sixty-first year, who complained that his wife, who was forty years his junior, was sterile. On the chance that this lay diagnosis was at fault, testicular tissue was transplanted in the husband, who promptly impregnated his wife, who later gave birth to an eight-pound boy. The author is of the opinion that sterility is just as frequent in the male as in the female, if not more so.

Congenital ovarian insufficiency as a cause of amenorrhea and sterility is believed to be rare.

Hypoplasia and hypoactivity of this kind is caused as a rule by hypoactivity of the thyroid or the pituitary. The adrenals are at fault at times.

These relationships which the various incretions bear to the sex function offer a basis for treatment of a large group of women suffering from sterility. Many authors recommend testicular and ovarian extracts for diminished sex function. The author has called attention before to his belief in the impotence of ovarian and testicular extracts taken orally. Some effects may be derived from the hypodermic administration of such extracts, but results of this hypodermic administration are practically *nil* compared to the results obtained by direct transplantation of either of the ovarian or testicular tissue. If the relationship of the thyroid and the pituitary to the condition under observation is carefully diagnosed and the indicated incretion added, then success will very often follow the treatment.

We know that a marked reduction of thyroid secretion in early life produces *cretinism.* If the thyroid secretions become diminished later in life, the ovary and the uterus may become infantile through atrophy. *Amenorrhea* may result; or, if the age of puberty has not yet been attained, the function may not be established at all.

If the deficiency in the thyroid comes later in life, after the sex function has been established for years, then, instead of amenorrhea, we may have *menorrhagia,* the menstrual periods being prolonged and the intervening time being shortened. This shows that a marked influence is exerted upon the sex organs and the sex function by the thyroid secretion, a decrease in this secretion in early life stunting the growth and the development of the sex organs, and in later life depressing the function of ovulation and menstruation.

In marked myxedema, sterility is the rule. The types of sterility due to lessened thyroid secretion coming on after the sex organs have been developed may be relieved by the administration of thyroid substance.

The influence of the pituitary on the sex organs is often greater than that of the thyroid. If one is alert to the changes caused by deficiency in pituitary secretion and will recognize it before serious harm has been done, appropriate treatment will often be followed by relief of both developmental and functional disturbances.

The inter-relationship between ovary, thyroid and the pituitary must always be borne in mind in attacking those functional disturbances on the part of the female sex organs which are due to causes other than inflammatory and mechanical.

Finally, sterility may follow toxemia, especially from tuberculosis, typhoid fever and mumps. A cessation of menstruation for a period of months is not uncommon in tuberculosis, and we often observe temporary hypopituitarism and hypothyroidism of various grades develop following the toxic states which are met in the course of chronic tuberculosis.

Tierney notes that attacks of *headache in women* are frequently associated with the menses, and are apt to cease during pregnancy, or during the menopause. *Migraine,* with its vasomotor phenomena, is probably due to disturbed endocrine function, in which the pituitary, the thyroid and the *ovaries* are involved.

Though the pituitary through its vegetative, nervous and vasomotor influence may play a rôle in the production of migraine, the latter must be differentiated from so-called pituitary headache which is a distinct entity. In this author's experience, true migraine has been paroxysmal, usually hemicranial, constitutional, hereditary and ordinarily associated with visual disturbance, nausea and vomiting. Cases of pituitary headache, usually found in individuals with other signs of pituitary disturbance, have been bilateral, non-paroxysmal and associated with different ocular manifestations.

In thirty-seven cases that were brought for various *mental disturbances,* in whom an endocrine study was attempted, Tucker found that twenty-two of the thirty-seven cases were pituitary-dominant, three were thyroid-dominant, three suprarenal-dominant, five OVARIAN-dominant, and in four the polyglandular disturbance was so evenly distributed that no particular gland could be said to dominate. In all, except one, more than one gland appeared to be affected.

The feeding of appropriate glandular extracts in these cases was decidedly encouraging.

Tucker also calls attention to the fact that the general tendency to *dementia praecox, paranoia,* and *manic depressive insanity* becomes pronounced during adolescence,

the period of endocrine readjustment and upset, connoting a more definite internal secretory connection than we are able at present to prove.

The relation of endocrinology to *conduct variations* also enters the psychiatric field. It is comforting to note that if conduct deviations are frequently of endocrine origin, it is also true that reformers are apt to be endocrinopathic.

The following are a few of the common endocrine disturbances in connection with *conduct deviation.* It has been observed that a large number of delinquent girls have hyperthyroidism. Hyperpituitary cases are frequently bold, incorrigible, opinionated and hyper-sexual, while hypo cases may be lazy, truant, ungrateful and deficient in integrity. Hyperadrenal cases may be overbearing, selfish, abusive; hypoadrenal cases may be cowardly and led through fear. Hypergonads show sexual irregularity and go to extremes in dress and action. Hypogonad cases may be perverts, asocial, cunning and cruel.

McCready calls attention to the fact that the period of adolescence, in both sexes, is a time of unusual physical and mental stress, tending to increase inherent weaknesses and to initiate organic and functional anomalies. The endocrine system, because of its intimate concern with growth and development, with metabolism, and with the phenomena of sexual maturity is particularly prone to disturbance of function. There is an intimate relationship between the gonads and the rest of the endocrine system. The endocrine implications may manifest themselves in many ways, requiring careful analysis for detention and for correct evaluation of their relative importance. Functional hypoadrenia is frequently found in adolescents, and is marked by sensitiveness to cold, hypotension, weak heart action, anorexia, anemia, constipation, asthma and other manifestations of hypersensitiveness, and by psychasthenia.

These patients are unable adequately to meet the demands of ordinary life. Fatigability is a manifestation of the condition, and exertion or sustained effort increases the adrenal depletion. These patients are emotional, crave excitement, but are fatigued by excitement. Often clever students, their work is sporadic and superficial. Their enthusiasm is intense but short-lived. They are unduly susceptible to infections and toxemias, and to reflex irritations.

Though normally "youth is a disease which cures itself," the class of cases under discussion require something more than ordinary hygienic care. Organic substances are of great value when indications for their use exist. In deficiency of the chromaffin system, suprarenal and pituitary substance are of value. When the basal metabolism rate is low, the action is enhanced by the addition of thyroid. In girls also ovarian substance may be given.

In the opinion of Castle, the essential cause of scleroderma is a combination of a disordered function of the incretory glands, together with an affection of the nervous system.

It seems that the incretory system acts as a whole, and if any particular gland fails the remainder of the glands act to minimize that failure. We cannot fix the responsibility upon any particular gland. Severe nervous emotion must be considered as a possible cause, owing to the influence on the sympathetic nervous system which is closely related to the endocrine glands. In some cases, no history of shock nor prolonged mental strain can be elicited; here the endocrine failure may be due to long continued poisoning, such as focal infections.

The thyroid is the principal gland which has a marked bearing upon *scleroderma.*

Scholtz notes that the old time conception of skin disease as a rigid and fixed pattern, remaining stationary throughout its course, has been abandoned for good. The modern dynamic viewpoint in general pathology has modified this conception to the extent that skin disease, as a clinical entity, retains its essential morphological characteristics and traits, but its clinical picture may present infinite variety and modifications depending on secondary changes, locations and peculiarities of the individual.

There is a relation between dermatoses and systemic diseases: the syphilis syndrome, tuberculosis syndrome, diabetic syndrome, erythema multiforme group and focal infection, the leukemic syndrome, the precancerous syndrome, and the endocrinous syndromes.

Scholtz mentions that to the internal secretions of the sex glands are attributed many cutaneous disorders; such are skin changes after castration, herpes progenitalis, *urticaria,* vicarious hemorrhages under the skin and the nails associated with the disturbances of menstruation, types of eruption described under the name of dermatitis dysmenorrhoica, pigmentation of the linea alba and the nipples, chloasma uterinum, and impetigo herpetiformia occurring in pregnancy, and a tendency to hypertrichosis and acne rosacea in the climateric period.

The frequent observance of disorders of internal secretions in a very large clinical group of angioneurotic dermatoses, such as Raynaud's local asphyxia, symmetrical gangrene, scleroderma, angioneurotic adema and dermographia, is highly suggestive of the close association and correlation of the sympathic vasomotor nervous apparatus and of the ductless glands.

In discussing the *dermatologic symptoms* of *endocrine dysfunction,* Bechet calls attention to the tremendous importance of the gonads. Their control of pilosis makes them extremely interesting dermatologically. Thus, removal of the male gonads results in scanty hair growth. Lowered activity of the gonads in old age is accompanied by atrophy of the skin and thinning of the hair.

In this connection the author has noted in several cases that following transplantation of testicular tissue for impotence, a marked increase of hairy growth in hairy regions. In one case of the author's series, a physician of repute, who developed a sudden alopecia following the onset of impotence, had a marked increase of hairy growth following transplantation of testicular tissue. Another case, that of a woman, age fifty-six, following the transplantation of ovarian tissue, called the author's attention to the lustre and wave that had developed in her hair after the operation. Her hair had been lustreless and straight for many years.

The relationship between ovarian dysfunction and hypertrichosis is well known. Bechet reports 146 cases of hypertrichosis in which eighty patients were found to have serious menstrual disturbances, but fully twenty-five per cent of the remaining sixty-five patients had minor anomalies of menstruation.

Normal sexual life seems to inhibit hirsuties. Of the 146 patients, 106 were unmarried. Of the 106 single women only four were less than eighteen; in all, puberty was well established.

The ovary is not alone responsible. There is an intimate relationship between the ovary, the suprarenal, the pineal and occasionally the pituitary body, so that *hypertrichosis* is frequently the result of a disturbed pluriglandular equilibrium.

Pulay maintains that the sexual organs have a certain influence on the *skin.*. Seborrhea becomes more marked at puberty. A *dermatitis symmetrica dysmenorrhoica* has been described. All kinds of skin disease may be influenced by menstruation. The pigmentation during pregnancy is well known. Seborrhea often dis-

appears during pregnancy. *Scleroderma* beginning at the menopause has been described. All these facts point to the existence of *relations between the skin and the gonads.*

In discussing the endocrinological aspect of *dermatology,* Feldman declares that there is justification in the general belief that dermatoses may be due to disturbances of the *sex organs.* Itching is given as the first sign of pregnancy. Itching of the genitals at various periods of life is known to all. So are the eruptions occurring during the life changes and their disappearance with the establishment of puberty.

In this connection the author would refer to a case of a woman fifty-six years of age, who, following a nervous shock, developed a marked eczema of the genitals. The case passed through various hands without relief. The author was called in consultation by the gynecologist to whom the case has been referred, and suggested that on account of other signs of ovarian disfunction, that transplantation of ovarian tissue might be worth trying. The patient objecting to any operative procedure was given large doses hypodermically of ovarian secretion. Relief was most instantaneous.

Acne invariably begins with the onset of puberty, and with very few exceptions, disappears with its termination. There are characteristic hair changes in this condition. In the male, the beard is scant, the facial appearance often resembling that due to castration—eunuchoidism. In the female there is a luxuriant growth of hair, often amounting to an actual beard.

These three symptoms—the appearance of the disease at puberty, the hair changes, and the diminished sex appetite—are dependent upon the *gonads* and their regulating glands, the thymus, the pituitary, and the thyroid. The extreme frequency of hyperglycemia in pustular acne also points to an endocrine origin of this condition.

The following case is of marked interest in this connection. Referred to the author by his physician in Washington, D. C., for gland transplantation for relief of an enlarged prostate, a highly educated man, age sixty-six, married, separated from his wife, was urinating nocturnally every hour. Rectal examination showed marked enlargement of prostate. Catheterization following urination resulted in five ounces of residual urine; urinary examination negative. Three weeks following transplantation, prostate had flattened down to less than one-third of its original size, patient sleeping seven hours uninterruptedly. Catheterization following urination gave less than one ounce of urine; urine examination negative. Hoping that transplantation of still more testicular tissue might cause complete disappearance of the former enlargement of the prostate, Stanley's method was utilized, and an ounce of crushed testicular tissue was injected subdermally. This tissue underwent necrosis and suppuration. Frequent urination developed, increased appetite, great thirst, rapid loss of weight, and urine examination showed eight per cent sugar. Following incisions permitting evacuation of injected testicular tissue, the constitutional symptoms disappeared and normality was again established. A month following this latter event, patient reported that he was sleeping twelve hours a night, that his sugar had entirely disappeared, and that he was feeling better than he had for years.

In spite of all that has been said, not all cases of acne respond to endocrine treatment. Pick reports an interesting case in a patient with a bad acne, in whom the disease completely disappeared after marriage at the age of twenty-six, only to reappear when he became a widower at thirty-eight. This would make it appear that abstinence may be an influencing factor in causing the disease.

Feldman describes the *skin symptoms of gonadal dysfunction as follows:* There is a very infantile skin in the male and an atrophy from lowered activity of the glands in old age. There is a thinning of the hair in the male and hypertrichosis in the female. The same occurs in a more marked degree after surgical removal. Most of the cases of hypertrichosis occur in unmarried women. It would appear that normal sexual life inhibits this condition. In hypertrichosis the ovaries do not act alone; there is a correlation between them and the pituitary, pineal, and the suprarenals. This is true of most of the conditions due to endocrine dysfunction.

Dermatitis dysmenorrhoiea symmetrica is a distinctly bilateral and symmetrical disease occurring only in women with complete amenorrhea, in those with a very scanty flow, and when the intervals are unduly pronounced. It is usually associated with hysteria. It is caused by a decomposition of ovarian protein within the ovary. This is demonstrated by a positive Abderhalden reaction for ovarian protein.

Feldman notes that there is a comparatively large group of pathological changes in the skin which are known to be due to thyroid dysfunction. Those found in hyperfunction are marked hyperhydrosis, especially of the axillae, transient erythemas, urticaria, prurigo, pruritus, melanosis, chronic alopecia, hyperkeratosis, and dystrophy of the nails. In hypothyroidism, there is a falling of the hair or it may remain sparse and undeveloped. Feldman has a case on record of an Italian girl of fifteen who had not yet menstruated and presented symptoms of cretinism. The alopecia disappeared rapidly under treatment with thyroid, pituitary and ovarian extract. She was completely amenorrheic, however, three years later although treatment had been continued.

Some of the so-called idiopathic atrophies, cutis verticis gyrata, ichthyosis and ichthyosis hystrix have been found in patients with thyroid dysfunction and have been benefited by thyroid therapy.

The French physician Zénope studied the *arterial tension* in about a hundred patients from the standpoint of the endocrine glands. He found that there is a relation between the blood pressure and theh ovaries and testes.

In men, the arterial tension varies inversely with sexual potency, and in women with the quantity of the menstrual flow. Whenever the menses commence to diminish, as at the menopause, the blood pressure begins to rise. The author's observation does not confirm Zenope's statement.

In Zénope's opinion, the hypertension is the result of hypogonadism. He tries to explain the occurrence as due to hyperthyroidism, produced by hypogonadism.

Sajous is of the opinion that various symptoms attributed today to *tuberculous infection* in cases in which the tubercle bacillus and the various tests prove negative, are but the results of pluriglandular insufficiency.

Following glandular transplantation for gonadal insufficiency, almost uniformly there has been a marked drop in blood pressure, when the latter had been excessive. In one case of his series, the author calls attention to the fact that the blood pressure dropped from 240 to 180 within fifteen days of the transplantation. A year after the transplantation the blood pressure was 150, and then again began to rise, which was probably due to the fact that the gland tissue had been entirely absorbed by the patient.

It is very suggestive that the symptoms of this condition are precisely those believed to indicate an early though undemonstrable tuberculous infection, viz., loss of strength, a low blood pressure, emaciation, anorexia often with gastric disorder and pallor usually attributed to anemia. These are not symptoms denoting infection

by a bacillus known to be capable of evoking a febrile reaction such as that which appears later or which may be awakened by an injection of tuberculin. When on the other hand, there occurs any degree of fever, that is to say, when the active symptoms replace those previously enumerated, which might be termed the passive symptoms of ductless gland insufficiency, then the protective resources of the body, including the ductless glands, attempt to do what the physician should have done.

Another leading thought which Sajous likes to impress on us is that the prevailing custom of awaiting a diagnosis of tuberculosis to inaugurate active treatment is one of the most active factors in the perpetuation of the disease.

On the whole, the relationship between the ductless glands and tuberculosis is mainly concerned with the defense of the body against infection. Clinical and experimental investigation shows that continuous defensive stimulation of the ductless glands such as that provoked by everyday exposure in thickly-populated centers tends to enhance the auto-protective efficiency of the body.

The French physician Bobeau looks upon polyglandular opotherapy as an advantageous auxillary to any of the usual methods of *tuberculosis* treatment. In his experience, patients treated with ductless gland products were markedly improved. He calls attention to the fact that the ductless glands do not function separately, but in mutual harmony.

This is especially true in *calcium metabolism*, the endocrine secretions constituting one of the factors indispensable for the fixation and utilization of calcium by the organism.

Polyglandular opotherapy is thus to be considered an adjuvant measure in the remineralization cure of tuberculosis. Disappearance of dental pain, which in Bobeau's cases always took place when urinalysis showed demineralization had been arrested, is an excellent clinical sign of improvement.

Jacquemin, in a paper read before the Bordeaux Medical Society (March 28, 1926), suggested a connection between pulmonary *tuberculosis* and gonadal function. He has observed that a consumptive patient recovered rapidly after an accident had deprived him of both testicles. The pulmonary lesions headed by fibrosis in the short period of three months after the accident. Jacquemin explained that pulmonary tuberculosis shows its highest frequency in early adolescence. It is most severe during the procreative period, and exceptional after the age of fifty and sixty. The severity of pulmonary tuberculosis is the greater the younger the patient. In some of its symptoms pulmonary tuberculosis reminds us of hypergonadism.

Experiments by Ancel and Boin have shown that castration in the male will bring about an increase in the volume of the adrenal glands, associated with an increase in the blood pressure. Tuberculous patients have a low pressure. In females, the intravenous injection of ovarian extract causes a diminution of the blood pressure. It modifies the respiratory rhythm, the respirations becoming smaller and more rapid. Seasonal factors which increase the libido aggravate the course of pulmonary tuberculosis.

Tuberculous patients, who are recovering, sometimes become fat at the expense of their potency.

The influence of pregnancy upon tuberculosis must be mentioned, and it is necessary to distinguish between pregnancy and labor. Pregnancy itself exercises a favorable action upon tuberculosis, which is improved in from sixty to seventy per cent of the cases. However, labor at once gives an impetus to the pulmonary tuberculosis. In many consumptive women, the tuberculous process becomes aggravated during menstruation, and, for that reason, treatment with mammary substance has been suggested.

All these considerations confirmed Jacquemin in his conclusion that there exists a direct relation between pulmonary tuberculosis and the gonad function.

Curschmann declares that *bronchial asthma* may be caused by endocrine dysfunction. He points to the well-known *fact* of the relations existing between asthma and the parathyroids. Attacks of asthma with symptoms of tetany have been frequently observed. Such cases are cured by calcium, which is a specific in the treatment of tetany.

The author has found that claustrophobia and asthma which occur in those aggravated cases of artificial menopause following oöphorectomy is markedly relieved by transplantation.

That the *ovaries* have an influence is proved by the asthma beginning in the menopause. Curschmann describes a case in which the asthma regularly returned during menstruation. In another case *diabetes insipidus* and asthma developed simultaneously. Postmortem examination showed a tumor of the mediastinum with metastases in both adrenals, hypophysis, lungs, kidneys, and spleen. These facts are suggestive of the kind of treatment to be instituted. In cases in which asthma begins in the menopause, the ovary should be treated.

Pardee declares that the part which the pituitary gland may play in the production of *headache* is frequently overlooked.

The clinical picture of severe frontal headache, somnolence, mental dulness, polyuria, glycosuria, oculomotor palsies, bitemporal hemianopsia, and evidence of disturbed bony metabolism, adiposity, and sexual regression, is a well known syndrome caused by pituitary tumors. But it is the early and less easily recognized pituitary disturbances on which interest must center, for that is the stage in which therapy will help, and one of the first symptoms of a pituitary gland which is functioning improperly is frontal headache which does not yield to the usual remedies.

The cause of pituitary headaches is an enlargement of the hypophysis following on a stimulus or demand made on it, or a pathologic condition of the gland. It is more common in women than in men, and may occur at any age, though it is most frequently seen in adolescence and early adult life. Pituitary headache is located between the temples, deep in behind the eyes, and is accompanied by dyspituitary signs. This headache is very persistent, usually lasting from one-half hour to forty-eight hours, and it may be continuous, frequently coming on in the female at the time of the menses.

Marked fatigue accompanies the headache, the patients feel slowed down in their activity, yawn excessively, are sluggish and willing at any moment to seek an opportunity for sleep. These patients are particularly prone to attacks of depression, which come on without any cause. The menstruation has certain characteristics in these pituitary individuals, the period being very irregular, often coming every two or three weeks, and the flow excessive.

Administration of the whole pituitary gland cures these headaches and the accompanying symptoms in a large percentage of cases, provided there is not a progressive neoplastic growth.

Blumgarten, in calling attention to the relation of the pituitary to adolescent epilepsy and nocturnal enuresis, emphasizes several points. The small contracted pelvis is a pituitary manifestation. Undescended testes occur in pituitary deficiency, indicating deficient gonadal de-

(Concluuded on page 66)

Facial Reconstructive Surgery*

With Presentation of Cases an d Lantern Slide Demonstration

JACQUES MALINIAK, M.D.

New York

Reconstructive surgery of the face deals with the anatomical and functional correction of congenital and traumatic deformities and those resulting from infections. This type of surgery is far from being new. Even in ancient times, surgeons were concerned not only with the removal of diseased tissues, but also with the repair of post-operative defects and the treatment of congenital and acquired deformities. Thus Celsus, who lived before the Christian era, described his method for the correction of cleft palate.

In the 16th century Ambroise Paré and Tagliacozzi described surgical methods in this field which are still of great interest to us. Tagliacozzi's, or the so-called Italian method in rhinoplasty is classical and continues to be in use without great modification (Fig. 1). The writings of Carpue, Duffenbach, von Langenbeck, Thiersch, Reverdin, Shimanowsky and many others prove that the study of facial reconstructive surgery was pursued unremittingly during the entire 19th century. The results, however, were far from encouraging, as is shown by the saying of Denonvillier, a distinguished surgeon of those days, that in rhinoplasty "the surgeon only substituted ridiculous infirmity for a loathsome deformity". It was only when a large amount of material afforded by millions of facial wounds had become available in the world war that the different methods could be applied, followed up and standardized. Large centers of maxillo-facial reconstructive surgery were organized in all the armies and it was only after years of this work that more or less definite methods were worked out and results crowned the efforts.

We continue at the present time to apply our knowledge gained in the late war to the treatment of everyday deformities. Many of these deformities may be avoided and I should like to insist on this point, which seems to me to be much neglected in works dealing with this subject.

In these days of prophylactic medicine, it seems natural that some attention should be given to the prevention of facial deformities. It is, therefore, very necessary that the fundamental principles of the subject should be made known to the general public. Many traumatic and post-operative deformities of the face could be avoided if the medical profession at large and the public knew more about this line of work. The laity should know enough about the prevention of facial disfigurements to avoid the omnipresent quack and all the disasters that follow "beauty cures".

Post-graduate work in this line is needed.**

Traumatic Nasal Deformities

Nasal injuries are extremely common on account of sports which have such an important place in schools and the whole life of the nation. These, as well as automobile accidents and industrial injuries, are the usual causes of nasal fractures. The injuries are generally not seen at the beginning by the qualified reconstructive surgeon, and too often indifferent methods of treatment are applied. As the pain in the fractured region is always acute, the patient listens with a complaisant ear to the advice to postpone

Fig. 1.—Illustration from Tagliacozzi's work "De Curtorum Chirurgia per infitionem," which appeared in 16th century, showing the Italian method of Rhinoplasty. This method remained classical and is still used.

the reduction of the fracture to a later date. Very often, also, the nasal fracture is masked by edema and an early diagnosis is not made. A radiograph is always useful in case of doubt, when the displacement of fragments is slight.

The treatment of recent fractures of the long bones is standardized at the present time throughout the world. Immediate reduction and immobilization of the fragments is considered urgent. The anatomical and functional restitution of the fractured parts is the principle care of the surgeon. Why such a difference of opinion in regard to nasal fractures? Is function and shape less important in the nose than in the arms or legs? The nasal obstruction that follows a badly set nasal fracture compromises the normal function of the middle ears, the respiratory tract and eventually the entire body. A permanently disfigured face is certainly not less damaging to the individual than a malposition of a fracture of the arm. Left to themselves, these bony fragments become fixed in a vicious position by the exuberant callus. The escaped blood organizes during the first week and the cicatricial tissue, which results from it, renders late reduction in the course of the second week difficult. The fractured fragments should be carefully kept in connection with the periosteum. If enclosed, they should be mobilized. The fractured or luxated septum should be replaced with the same care. Systematic endonasal packing will maintain the fragments from within. A copper or lead splint prepared after a pattern must be applied externally.

The correction of an old nasal fracture is mar more tedious.

No correction of this deformity is possible without the resection of a fragment from the frontal process of the maxillary bone on the flat side, and an infraction on the opposite side of the nose. The latter is

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* Read before the Academy of Medicine of Northern New Jersey, Section on Head Surgery, at Newark, October 11, 1926.

**Courses on this subject have been arranged by us at the Cincinnati Medical School, and in connection with the Kings County Medical Society. Similar work is being started at different medical centers here and abroad.

thus easily replaced into the normal position and immobilized.

Nasal Deformities After Submucous Resections

Deformities very frequently occur after a submucous resection of the septum, and this should all the more be taken into consideration as, this operation is one of the most frequent nasal procedures. The deformity which results is generally very conspicuous, and as it closely follows the operation, the relation of the cause and effect is evident to the patient. In the majority of cases, the operative technic is at fault. The details on this subject have been described by me elsewhere (1) and here I wish only to make the following remarks:

On account of the lack of reinforcement of the septum by the triangular cartilage immediately above the nasal tip, the remnant of the cartilaginous bridge, if insufficient, is liable to break down under the slightest trauma and a dorsal depression follows. The cartilaginous bridge after a submucous resection should be at that level at least one-half inch high. The free edge of the quadrangular cartilage forms a part of the pillar for the nasal tip, and if resected at one of its ends, produces a flattening of the nasal tip.

Indirectly, an acute or chronic nasal infection during a submucous resection may cause a post-operative nasal deformity through involvment of the operative field and necrosis of the remaining cartilage. The nasal condition should, therefore, be thoroughly investigated before the operation and the latter postponed in case of free pus or acute catarrah.

After a submucous resection, the two plates of the mucosa are to be held in place for 24 hours by a metal splint, which we always apply, thus assuring a uniform pressure and avoiding the formation of a hematoma with resulting infection. The plugging of the nasal fossae with pronounced discomfort is thus avoided. It goes without saying that, in so doing, we add the advantages mentioned above, the free circulation of air in the middle ears and the absence of stagnation of pus in the nasal cavities and pharynx with the possibility of descending infection (tonsillitis, laryngitis, etc.). When a post-operative deformity appears (dorsal depression or flattening of nasal tip), its correction is the same as in the congenital deformities, of the same type, about which we shall speak below.

Congenital Nasal Deformities

As the nose is the distinctive feature of the human face, the least deviation from normal produces a change of facial expression. Partial or total defects of the nose are among the worst deformities that exist. Deformities of the ear, the forehead or the chin may be masked, but those of the nose are always striking. Therefore, it is not surprising that the minds of those patients are anxiously fixed on their deformity, causing mental depression. They are handicapped in their work and social life, and their mental distress exagerates in their minds the importance of their physical deformity. In the past, because of their mental depression, these patients were considered hypochondriacs and the necessity of cosmetic operations was questioned. At the present time, corrective rhinoplasty has been shown to be successful, and the series of patients, which I shall present to you this evening, I hope, bears witness to this. Comparing the contour and expression of their faces with their preoperative photographs, and casts, you will readily realize the moral, professional and social importance of rhinoplasty.

a b c

Fig. 2.—Miss R. W. age 26. Oversized nose in which the length, width and height have been remodeled in harmony with the face. Note changement in facial expression. (Patient presented at the meeting.) a—before. b, c.—after.

Technic

For the details of the technic, I shall have to refer you to my previous publications, (2), (3). Here I wish to state only the cardinal principles.

Local anesthesia is the rule in these operations. Ordinarily, I use the endonasal route. The nasal cavities should, therefore, be carefully examined, and infection excluded before operation. In case of a chronic infection (ozena, sinusitis), the external route is preferable, with incision in the columella or eyebrow. In an oversized nose, the length, height and width should all be taken into consideration, and the remodelled nose made in complete harmony with the entire face (Fig. 7). *An artistic sense is not less needed in this work, than perfect technic.*. The osteo-cartilaginous prominence of the nose is removed with a saw. This correction can be made also by the removal of triangular fragments, on each side, from the frontal processes of the maxillary bones and the septum: it is the procedure of lowering the dorsal prominence.

Auricular or alar cartilage may be of good service in the correction of small nasal depressions. Costal cartilage is used by me as a rule. Ivory,[4] which I tried for a long period of years experimentally and clinically, has its indications as a nasal transplant, if the patient refuses to provide his own cartilage (Fig. 3). A syphilitic deformity, congenital or acquired, should no longer occur, if early and intensive antileutic treatment is ap-

plied. The characteristic appearance of a leutic nose is due to a more or less extensive necrosis of the nasal bones with great loss of the mucous membrane lining. In these cases, the skin cannot be sufficiently undermined

Fig. 3.—Mr. D. P. age 30. Depressed nose bridge due to professional boxing, corrected by an ivory transplant because the patient refused to provide his own cartilage. The transplant was introduced through the left eyebrow. Operation requested for professional and social reasons after changement of career.

for the introduction of the transplant, because of the adherence of the cicatricial mucous membrane in the region of the apertura pyriformis. The correction of this type of deformity, made simply by the introduction of a cartilaginous transplant, will not be satisfactory, as it is incomplete and the luetic appearance of the nose remains unchanged.

The epithelization of the nasal cavity by a Thiersch Graft, introduced by means of a moulded piece of Stent's mass, presents the first stage of the correction. The cartilaginous graft is introduced some months later (Fig. 4).

This method, the only one that overcomes the leutic aspect of the nose, gives perfect results, but requires much time from the patient and the surgeon. This procedure, which was brought out by Gillies[6] in applying the principles of Esser's epiphelial inlay, may be also used with success in the treatment of stenosis of the nose, ectropions of the eyelids and lips, and deepening of the gingivo-labial cul-de-sac[5] (Fig. 5).

For the correction of a leutic nasal disfigurement with partial or total loss of the organ, the same methods are applied as in extensive nasal war injuries. The difficulties, however, are increased in lues because of

Fig. 4.—Mr. T. F. Cougenital nasal deformity corrected by introduction of a graft through the eyebrow. Operation requested for professional reason, this patient being an official of a Department of Public Welfare.

Fig. 5.—McA. age 4. Dentigerous cyst of the left antrum with necrosis of the walls. The Retraction of the upper lip due to the bony defect and scar formation, was released by excision of the scars and Thiersh grafting of the wound surface.

the endarteritis and the low vitality of the tissue.[8] The lining was the key to the success of rhinoplastic efforts during the War. All failures of pioneers in nasal reconstructive surgery, which could not be overcome during many centuries, and at the beginning of the War, have been due to the omission of the nasal lining. Even last year during our visit to Paris, we saw some old cases of total rhinoplasty made at the beginning of the world war by the old method which did not provide sufficiently for the nasal lining. All of these newly rebuilt noses have been completely obstructed and have lost their shape. The nasal lining has to be provided from the skin around the defect or by an epithelial inlay, as explained above.

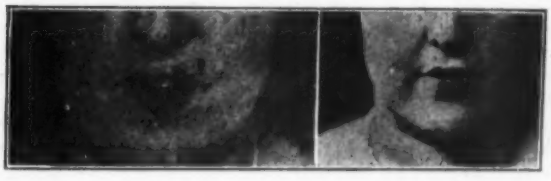
Harelip

The technic is well known and described in all classical treatises. I would say some words only in regard to late post-operative results. Even after operations by the most skillful surgeons, we often see a deep notch of the lip with flatness of the latter.

It is also necessary to mention the harelip nose, characterized by flatness and a lowering of the corresponding nostril. The notch of the lip, which is particularly conspicuous, may be corrected by dissection of a mucous membrane flap taken from the posterior part of the lip (Fig. 6) and suturing it in a lower position. The flattening of the nostril is corrected by excision of a rhomboidal fragment of vestibular skin, and suturing of the nostril near the columella. Pronounced flattening of the upper lip is often observed in a repaired harelip. It can be corrected when a denture is worn by deepening the gingivo-labial sulcus in which the gum of the denture is placed, thus making the lip to protrude.

Paraffin Transplant

Paraffin was used for the first time in facial reconstruction about 1890, by Corning of New York, and later by Gersuny of Vienna. Its use at that time was



a b

Fig. 6.—Miss S. age 20. (a) Sequel of a hare lip operation performed in early childhood. This patient, whose father is a physician, was advised not to undergo a secondary plastic repair because of a possible "curling of the lip." (b) Result after operation by sliding a triangular mucous membrane flap and tattooing the overlapping skin fragment.

much in vogue and it was employed especially for cosmetic purposes on the face and chest, as well as in rhinology to narrow the nasal fossæ in ozena. However, one soon found that along with the immediate success, one also encountered numerous accidents and frequent failures due to peculiarities of the paraffin and susceptibility of the patient. There were frequent reports of emboli, especially of the central artery of the retina, chronic inflammatory reaction and diffusion of the injected paraffin in the surrounding tissues. These were due to the use of liquid paraffin with a melting point of about 100 degrees F. Solid paraffin with a melting point of about 140 degrees F., although prized at the beginning, as being safe, turned out to be dangerous by its late complications, namely, the formation of tumors called paraffinomas. Anyone who has seen a case of this kind I ame sure would dismiss the use of paraffin. Applied for the correction of depressed noses or cheeks, paraffin may give good results in certain cases, but in the course of time, varying from 3 to 10 years, the paraffin may be displaced and infiltrate the subcutaneous tissues and the skin. A hyperplasia of connective tissue is formed around the injected mass, which undergoes a complete transformation.[8,9]

One finds hard, painless masses infiltrating the skin, subcutaneous tissue and mucous membrane of the mouth. The skin is shiny and sensitive to changes in temperature. The contour and expression of the face changes and becomes very conspicuous.

Microscopically, it is composed of cellular elements, surrounded by inflammatory tissue. The paraffinoma does not necessarily follow the injection of paraffin. This tumor needs for its development a predisposing soil, which it is impossible to recognize in advance. (Follows presentation of two paraffinamos of the face.)

Ear Deformities

Among ear deformities, the most common are protruding ears. Their correction is brought about by the excision of cartilage and skin, usually from the concha, with the removal of the resulting folds on the anterior surface of the ear. Other deformities which require correction are hypertrophy of the ears (macrotia), abnormally shaped ears, synechia and post-auricular fistulæ after mastoidectomy. The reconstruction in case of total absence of the ear is the most difficult task, because of the irregularity of the organ. (Case presentation.)

Skin Deformities

These are a source of keen distress to thousands of women. Everything goes the way to death by a progressive decline, but for one who dies of old age, a hundred die of accident or disease. If we cannot avoid death, at least we can retard it by preventing accidents and infections which hasten it. These generalities apply to the life of the skin, especially of the facial skin, the latter being exposed and less protected than the rest of the body. Very cold or hot air, wind or rain are harmful, and if we add to this the influence of cosmetics used by women from their girlhood, we will have the causes of a prematurely injured skin, which is creased and flabby. A personal predisposition also plays an important rôle. Professional and social reasons make these patients require help. The so-called facial lifting is indicated especially for women prematurely aged with a very flaccid and a drooping skin. The excision of the skin should always be done in the periauricular region, largely hidden by the hair.

A complete undermining of the skin is necessary. The insertion of subcutaneous fascia loops is indicated to efface the folds. The results obtained in these patients are often amazing, and their mental and professional status is thereby greatly improved (Fig. 7).

Fig. 7.—Miss D. age 45. Facial lifting and removal of wrinkles around the eyes. Picture taken four days after operation. Professional indication as patient was in danger of loose her occupation as school teacher, for looking "too old."

Conclusions

1. The field of facial reconstructive surgery is growing rapidly, as its value becomes evident to medical and public opinion.

2. Prophylactic measures in this field will avoid unnecessary deformities.

3. As a rule, nasal deformities have to be corrected by the endonasal route.

4. Skin, cartilage and fat are the best transplants to be used in facial reconstruction.

5. Paraffin is to be condemned, as are all other inorganic substances. Ivory, as a dead organic substance similar in structure to bone, has its indication as a substitute in some instances.

6. Aged and flabby facial skin can be surgically corrected in women for professional and social reasons.

7. A thorough rhinological and general surgical training together with some artistic inclinations are necessary requirements for this work.

Discussion of the Paper

Dr. H. H. Forbes:

It gives me great pleasure to respond to the invitation of your Society and also to make these few remarks on the paper of my friend, Dr. Maliniak. My interest in plastic surgery dates back to the days when my preceptor, Professor Roberts, transplanted the breast bone of a duck in a male patient with the saddle back deformity—1888.

It is needless to add that the result was not satisfactory. The patients presented tonight, together with the paper and pictures showing the advance which has been made since my early work, cannot but impress the fact that, while the work may become even more a special department, it is within the province of the nose and throat specialist to deal with all acute fractures of the nasal bones and also to operate in the regular line of post-traumatic fractures—humps and non-specific saddle back deformities. These cases should be referred to us in the general hospital and form a distinct part of our work. My own work has been with bone, bone-cartilage and cartilage. For nasal work I limit my grafts at present to rib cartilage.

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(*Concluded on page 72*)

A Synopsis of Pulmonary Tuberculosis

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The production of sickness is merely incidental to the successful attack on the part of pathogenic bacteria to establish new quarters in the human or animal body. Bacteria are not active by their mere presence, but through the poisons or *toxins* they produce.

Bacteria may enter tissues of the body at times without producing disease, due to the vital resisting powers of the individual. To favor an infection, bacteria possessing virulence must invade the body and find a receptive environment aided by lowered vitality of the host for progression of pathogenic effects. The resultant type of disease depends upon the ratio between the toxicity of the infection and the opposing power of the individual.

Tuberculosis is due to the growth in the lungs, or less frequently in other parts of the body, of the bacillus tuberculosis. The avenues of infection and the tissues attacked alter the type of diseases. If the tubercle bacilli enter the skin they produce *lupus;* if swallowed, they cause ulceration of the intestines, and subsequently invade the peritoneum; if inhaled, tuberculosis of the air passages may follow.

The tubercle bacillus is an aerobic parasite, found wherever human beings live in crowded quarters, in dust of rooms, vehicles and streets, and often in bread, milk and butter, etc. Due to the resistance of the fatty or waxy capsule of the bacillus, it opposes staining by ordinary methods, but when once stained it resists the discolorative action of strong acids, hence is called "acid fast."

This is a very important discovery, its value rests on finding microscopically bacilli stained by a special method which is a positive aid in making a bacteriological diagnosis.

The bacillus thrives best at 37.5° C. Its thermal death point (moist) is 80° C for ten minutes. It can resist 60° C. for an hour, but succumbs to 95° C. in one minute. Generally speaking the presence of water is absolutely essential for bacterial life, yet the tubercle bacilli may withstand complete drying for two to three months. This constitutes the chief source of danger to others through the subsequent dissemination of dust containing dried bacilli.

The unit of bacterial measurement is a micron: which is a unit of length equal to one-millionth of a meter, or one one-thousandth of a millimeter, or one-twenty five thousandth of an inch, and is usually represented by a Greek letter μ.

Bacilli vary from 1 μ to 3 or 4. Sixteen hundred million bacilli weigh approximately one milligram; a normal red blood cell is fifty thousand times as heavy as a single colon bacilli.

The duration of bacterial life is unknown. We do not know the biology of the parasite, its simplicity or complexity, its constancy or the variability of its life cycle.

TRANSMISSION: An invalid with an open lesion can expectorate about seven billion bacilli in 24 hours, therefore, in civilized regions the infection with tubercle bacilli is well-nigh universal. There is scarcely an adult who does not react to tuberculosis in some way.

The bacillus may penetrate the pulmonary tissues: (1) by ingestion, (2) by inhalation, (3) through the blood stream and (4) through the lymphatics. In hereditary tuberculosis the possibility of transmission by the sperm is rejected, but infection by the ovum is accepted.

Individuals who are in a healthy condition are generally able to resist the invasion, holding the infection in the lymphatics, the peri-bronchial, the tracheo-bronchial or the intestinal glands. This conflict between parasite and host may end very early in favor of entertainer. The presence of the invasion may not be suspected during life. When the patient's vitality is below par, the converse of the proposition obtains. The bacillus will pass from the barrier in the glands and will journey through the organism by way of the circulation, producing an acute tuberculosis, or by the lymphatics, in which case a chronic process sets in. Usually, however, there is a close balance between the resisting power and the virulence of the infection.

The result of the activity of the bacilli is shown by the formation of toxins, which are absorbed into the blood, and give rise to fever and other signs of toxemia. These toxins, together with some free bacilli, incite the circulating leucocytes of the patient to the formation of antitoxins which are capable of killing the tubercle bacilli; and of neutralizing their toxins.

Whether the patient improves, or goes down hill, depends on the balance between toxins and antitoxins in his circulating blood.

It is generally accepted that the incidence of tuberculosis in any country, in both sexes and at every age, except infancy and childhood, reflects with great precision the living and industrial conditions prevailing. Adults enjoy a relative immunity because they are already infected. This, however, can be overcome by re-infection by tubercle bacilli in considerable numbers, or by other conditions, such as malnutrition, which lowers resistance of the individual.

We do not know, or know conclusively, the relation of infection and lesion to immunity, or of virulence and resistance, and the relative importance of these factors in the development of disease.

PATHOGENESIS: Infection is manifested by the formation of fine gray tubercles the size of very small shot. Microscopically in the centre of the tubercle are found several large giant cells, which often contain thirty or more nuclei and a number of tubercle bacilli. At this stage one of two things may occur. Due to faulty blood supply, the center of tubercle may undergo caseous degeneration, or, if the lesion heals, the caseous centers become calcareous, and the periphery changes into connective tissue. Should the tubercles coalesce, great masses of caseous tissue form, rapid softening occurs, and, with its evacuation into the bronchi, produces cavities.

While in certain portions of the lung the process may have reached the third stage, in other portions tuberculous infiltration may be just beginning. All lesions, even the cavities, may heal by the formation of fibrous tissue.

To the latent infection contracted in childhood many writers attribute all adult tuberculosis. Others believe that adults, whether harboring latent infection or not, may be infected from without. This speculation is relatively unimportant, except in the padding of books,

as in either case the adult must be in a receptive condition of lowered vitality to develop the disease.

Cattle are subject to tuberculosis, and milk from infected cows often contain the bacilli. The germ causing bovine tuberculosis seldom or never causes tuberculosis of the lungs in man, but does produce disease of the bones, joints and glands. About 8% of all deaths from tuberculosis are due to the bovine bacillus, most of the victims being children.

A patient enters your office complaining of a persistent cold or hoarseness that seems to stick, he has tried everything for it (your good friend the druggist has had him first), but nothing relieves him, he says he has lost his appetite, tires easily and feels miserable generally. Evidently this is a sick man, who demands immediate and lasting relief.

All medical literature prefaces an examination of the patient with the advice, first obtain a complete *family* and *personal* history. Ascertain his *mode of life* and *surroundings*, and through his family history, the probable influence of *hereditary disease diatheses* or *liability*. Then trace the beginning of his present trouble, and your fallacious conclusions are unavoidable.

Punch's advice to those about to marry—Don't—seems also applicable here. *Never* question your patient concerning his history, habit or environment until you have made your physical examination and noted your findings. It may help you after your observations but before it is simply irrelevant, immaterial and usually misleading.

Tuberculosis plays no favorites, and there is no typical appearance of shape or size in person attacked. They may be tall or squatty, fat or thin, sheiks or otherwise, good or bad, old or young. There may or may not have been other cases in the family, which in a long series of cases may have some remote value. But for the particular patient before us, those findings are simply rubbish. The diagnosis must be made on the physical conditions and on those alone. In other words, we first observe facts, and interpret the same, which leads by the inductive method to the recognition of a certain existing disease.

A noted real estate operator in a recent issue of the *Saturday Evening Post* declared that only about 10% of the families in this country own their own homes. Changing our habitation frequently is a national habit. Why ask a patient if anyone in his family had consumption, which he might truthfully deny, and yet the tenants who previously occupied his room in home, hotel or steamer may, unknowingly to him, have been tubercular. Why waste time and effort in trying to find out if a patient has a tubercular history when statistics show that infection is nearly universal.

Confine the examination to objective fact, to physical diagnosis. You may listen to patient's story, but do not give weight to statements not supported by physical signs. In tuberculosis the patient becomes accustomed to everything that recurs daily—cough, temperature, lassitude —this is one of the causes of his admirable delusions as to his condition and prognosis.

The diagnosis of pulmonary conditions suffers from the sins of omission of the examiner rather, than from a too minute clerical attention to unimportant variations from the assumed normal.

Do not be misled or led to exercise faulty judgment by the extremists of the "early diagnosis cult" when they tell you that if physicians were alert and keen, and not too ignorant, they could save every consumptive life had they diagnosed the disease at its first flicker. The inuendo is obvious, the difference between those writers and the advertising quacks is simply the latter are no hypocrites since they pay for their lying publicity.

Never make a diagnosis of pulmonary tuberculosis unless you can prove it. You may have your beliefs, and you may treat your patient for tuberculosis, but do not make an error, as if you mistake some mild ailment for tuberculosis, the result may be disastrous.

It may mean abandonment of a lucrative job or a promising career, separation from family and an unavoidable amount of varied anxieties. Today a throat or lung lesion, which, obviously, is not something else, is diagnosed as tubercular. Even in Germany, where we all know no physician ever made a mistake, they admit they fail where they proclaim they excel.

MEISSEN: "Says the fear of being regarded as a poor diagnostician leads to the making of the diagnosis on uncertain and slight indication."

ROEPKE: "Ten per cent. of the inmates of German sanitoria are not tubercular."

FRANKEL: "Believes the reason for the errors in diagnosis lies in the fact that too great value is placed on relatively insignificant findings."

MULLER: "I know several cases in which patients have been treated for years for dullness of apex, the autopsy showing normal apices."

Now for La Belle Francais:

RIST: "At my suggestion the medical officer in command ordered all the men coming from the front with a history of coughing, blood spitting, pleurisy or with a diagnosis of tuberculosis to be taken to a clearing station. . . . As a matter of fact, between 80 and 90 per cent. of those supposedly tuberculous soldiers were not tuberculous at all."

BEZANEN and SEYENT bring forward other facts which corroborate those views.

Our own COLONEL BUSHNELL, the peer of them all, "has been surprised in his professional experiences to see upon what slender basis the diagnosis of pulmonary tuberculosis is often made."

TOLSTOY wrote in his diary, in 1903, that "it seemed to me that one of the errors in medicine is an excessive refinement of methods and apparatus, where mistakes are easily made. I do not wish to belittle those refinements, but at the same time I do not think physicians should lose sight of the elementary principles in the cause and treatment of disease."

Now we will return to our patient, and have him strip to the waist.

Remember that a miracle is a fact inaccurately observed, and you will appreciate the necessity of vigilance in your observation of *color, form* and *actions*.

INSPECTION: Stand directly in front and compare both sides. Flattening of the chest over apex, and diminished respiratory movement over the affected area would indicate consolidation in that region. The vigor of costal excursion over any pulmonary region mirrors the extensibility of the underlying lung. Because extensibility is the first attribute affected in all pulmonary diseases, any impairment offers the earliest evidence of regional lung disease.

PALPATION: Have patient at ease and examiner must also relax. If your own hands are tense and placed on patient you are going to get fremitus from your own tissues. Have your hands warm and lay on gently, as your tactile sense of fingers become impaired by undue pressure, when the palm of the hand is applied to the chest of a speaking person a diffuse, vibratory sensation is perceived, usually slightly greater in intensity on the right side than on the left. This is known as vocal tactile fremitus. It is increased over

areas of consolidation, except where pleura is thickened, *when it may be reduced.*

PERCUSSION: When percussing the finger struck should be firmly pressed against the chest, and by preference is the second finger, strike at the root of the nail, and always with the same force. That derived from movement of the wrist is enough. Percuss symmetrically or in straight lines. Light percussion for superficial structures, heavy percussion for deep structures.

Always begin to percuss in front in the axilla, you have probably been taught to begin at the apex and and percuss downward—*don't do it.* Establish your normal note first, and percuss upwards and you will avoid a great many errors in percussion. If you percuss from above downwards, you may carry a dull percussion sound to the fourth rib, when if you had percussed from below upwards, you would have noted dullness only to the second rib.

By *percussion* we learn as to the relative distribution of gases (usually air), fluids and solids in the structure examined. And we note the *quality* (or *timbre*), the *pitch* and the *intensity* of sounds.

Other things being equal, the greater the volume of matter set in vibration the greater the intensity of the sound.

AUSCULTATION: Gives information concerning the movement of air and fluids, the comparative calibers and lengths of the tubes through which the air passes, and the presence in the air path of matters capable of acting as reeds in the production of musical tone.

In listening to the breath sounds, have patient breathe deeply and quietly. Use the same instrument constantly; the use of a variety bewilders.

The normal respiratory sounds consist of a soft breezy inspiration—the *normal vesicular murmur*—followed by a scarcely audible, briefer expiration. The character of breath sounds may be altered and their rythm deviate from normal. They may be *exaggerated, puerile, intensified, harsh* and raised in pitch. *Dry rales* may be heard, *sibilant,* if generated in small tubes; *sonorous,* if generated in large tubes. *Isolated sibilant rales* are usually indicative of pulmonary tuberculosis.

When vesecular murmur is partly obliterated, the breathing is termed *vesiculo-bronchial;* if the bronchial element predominates, *broncho-vesicular.* When vesicular quality is lost the breathing is called *bronchial, tubular* or *blowing.* Where there is a cavity the breathing may be cavernous; and with a tense cavity wall and small orifice connecting with a bronchus the sound is amphoric.

Secretion in the bronchial tubes causes râles qualified as moist: subcrepitant, if in small tubes, mucous if in the larger.

Exaggerated or harsh breathing is compensatory in character. It indicates disease of the corresponding *opposite* lung.

KRONIGS ISTHMUS: Now we will percuss Kronigs isthmus to see if it is narrowed. (The isthmus is the narrowest portion of the lung lying above the clavicle in front and the spine of the scapula behind). If you find a narrowing of the isthmus and a sagging of the apex, shown by depression above and below the clavicle, you know that it is not *acute tuberculosis,* because in that condition you get a *congestion* not a *contraction.* If it is a chronic tuberculous lesion we are dealing with, then we must find whether it is an active or inactive disease, and we will find that out by auscultation. You have read in many places that the earliest possible sign in the incipient stage of tuberculosis is prolonged expiration. *That is all wrong,* as you only get those sounds in the presence of connective tissue, which cause the sound carried by the bronchi to the surface more readily. *You don't get these sounds from congested tissues, but contracted tissues.* Change in breath sounds do not show whether it is an active or inactive disease; it is simply corroborative of a chronic lesion in the apex.

You can always prove whether condition is active or inactive by the presence of persistent fine râles. Auscultute following exhalation and cough. Starting from the state of rest of the lung, the patient forcibly expels the air from the lungs, reserving the last portion of the expiration for a short cough, after which inspiration immediately follows, but only enough air is inhaled to return the lung to the state of rest. The idea is to diminish the size of the bronchi as much as may be by expiration then to cough to stir up forcibly such fluid as may be present in them. The moisture is more likely to be moved by the current of air, and so produce râles when the tubes are of their least caliber. This examination is essential in every case, and should be practiced by every practitioner. Its correct performance is more valuable than reams of the genealogical, sociological or eugenical history of the patient.

ACUTE TUBERCULOSIS: No change in percussion note, no narrowing of isthmus, no change in breath sounds; shower of fine, persistent râles in one apex extending down to third dorsal vertebrae.

CHRONIC ACTIVE TUBERCULOSIS: Contracted apex, narrowing of the isthmus, change in breath sounds and tubes, but not persistent, fine râles.

CHRONIC INACTIVE TUBERCULOSIS: Contracted apex, narrowing of the isthmus, change in breath sounds, but not persistent râles.

ACUTE OR CHRONIC BRONCHITIS: Scattering of râles over whole chest, mixed râles in the base over both lungs and some fine râles above. Râles occur with no reference to inspiration or expiration.

Any cold or bronchitis limited to one side is suspicious, and if such symptoms are confined to the apices, the suspicion is doubled in value, and any bilateral bronchitis at the apexes deserve special attention. If in examining the supra-clavicular spaces by digital pressure, there is disclosed a fixed point of tenderness, or you find, rolling beneath the finger, like leaden shot, a few small enlarged lymphatic glands you should be guarded in your expression respecting duration and proposis.

X. RAY: The characteristic marks of tuberculosis, as shown on the Xray plate, consist of a fan-shaped density with the base of the triangle toward and near the pleura, and with the apex toward the helium of the lung and connected to it by a heavy trunk. If the fine linear markings of a given trunk are faintly obscured by a cloudy or fuzzy effect, an active lesion is suspected; but if the linear markings in a limited area are sharply defined and dense, a healed lesion is suggested.

We do not see tubercles in the X-ray negative any more than we see tubercle bacilli in the X-ray. What we see is sharply outlined calcifications and fibroses, or fuzzy congestions, or a combination of the two conditions. We see only the result of tuberculous inflammation.

Do not expect that a lesion in the apex so mild in character that it cannot be detected by the auscultating ear will be disclosed by an X-ray examination.

Local:

Table of Diagnostic Signs

CLINICAL

Cough: Consider habit and environment, may be slight, hacking or persistent.

Sputum: At first frothy, later fibrous and shows elastic tissue of lung, contain bacilli; 2nd stage.
Hemoptysis: Occurs in about 60% of cases.
Pain: Has little clinical significance.
Dyspnoea: Marked in disseminated tuberculosis.
Voice: Hoarseness point to lesion of larynx.
Eyes: Phlyctenular conjunctivitis in children would indicate tuberculosis.
Mind: Usually clear and hopeful.

Constitutional:

Pyrexia: Temp indicates degree of toxicity.
Weight: If diminishing, important in prognosis.
Anaemia: Nasal and buccal mucous membrane in incipient tuberculosis are usually flabby and pale.
Circulation: Pulse frequent and feeble. Pulse may disappear when the arm at side of lesion is raised straight above the head.
Atonic dyspepsia: May be accompanied by vomiting and diarrhea.
Sweating: Cold, occurs at night, followed by exhaustion.
Fistula in Ano. Usually tuberculous manifestation.
Lethargy and Muscular debility.

PHYSICAL

Consolidation:
Inspection: Costal excursion less, chest flat over affected area. Ends of fingers bulbous, nails incurvated.
Palpation: If pleura is not thickened, there is increased vocal fremities.
Percussion: Dullness over consolidation.
Auscultation: Moist rales.

Cavitation:

Percussion: Tympanitic or cracked pot sound.
Auscultation: Low pitched bronchial breathing, or amphoric resonance, metallic rales, Pectoriloquy.

Miliary:

Inspection: Dyspnoea, cyanosis, movement alae nasi.
Auscultation: Bubbling rales.

X-RAY

Fluoroscope: A faint shadow replaces normal pulmonary transparency in the affected area, may be demonstrated by skiagraphy.

Treatment

GENERAL DIRECTIONS: In pulmonary tuberculosis we prescribe not medicine, but a mode of life. In fighting its mortal enemy the body has several tasks:
1. To make antibodies against the tubercle bacillus.
2. To erect fortifications in the shape of encapsulations.

The tubercle bacillus has no "days off"; and don't permit your patient to interrupt the treatment on any excuses. Just as the disease may exist for a long period in a dormant state, unsuspected, and giving rise to no symptoms, just so does it take a long time—months or years—to accomplish a "cure," a "recovery" or an "arrest of disease."

The physician as soon as he has recognized the existence of tuberculosis, must announce the fact to that patient since that is the only way to keep him from being a menace to himself or society.

The earlier treatment is instituted in pulmonary tuberculosis, the better for the patient, and the greater the chances of an ultimate cure, treatment consists of several essentials—fresh air, rest, good food, proper care, suitable environment.

OPEN AIR TREATMENT: The open air treatment must be carried out in the shade—not in direct sunlight. Experience has shown that direct sunlight, even in winter, is prejudical to patients who are not moving about. A French writer states that "in the open air cure the patient should see the sunlight, but should *not* let the sun see him."

Protect head and trunk from sun's rays.

Every hour possible should be spent outdoors, or in airy, sunny rooms. Rooms must be bright, clean, and well ventilated.

CLIMATE: Great climatic changes are risky, slight climatic changes with short distances to travel, if an invalid wishes to return to her own home after improvement or restoration to health, produce better permanent results. The benefit to be derived from residing on a high altitude is not proven. Madrid and Mexico City are built on high altitudes, but it is not claimed that tuberculosis is rare there. Tuberculosis is frequent in the mountains of the Hautes-Vosges, and of the Tyrol, and it is common knowledge that at Loux and at Chandde-Fond in Switzerland tuberculosis is prevalent despite the high altitudes of these stations.

The fact cannot be too strongly emphasized that of all the factors that make for improvement in tuberculosis *climate is the least important.* Living in a favorable atmosphere of pure air is absolutely essential, but no climate can atone for insufficient food, nor for the necessity of working when one should be resting, and least of all make up for the devitalizing effect of homesickness or of excessive worry.

In his aboriginal state man was able to live in the open like the lower animals, and hold his own against all elemental disturbances in primitive types of shelter. He needs, to a certain extent to return to the aboriginal outdoor life. Not only at night but also by day the patient should live in the open air, either at rest, sitting or reclining, or taking light exercise when prescribed.

REST: With complete physical rest, as nearly as attainable, tuberculosis, unless very active, takes care of itself extraordinarily well, but we must bear in mind that the lung is an organ which never rests but expands and contracts at least 12,000 times daily. This constant movement of a tuberculous lung is one of the chief mechanical factors responsible for the chronicity, progressiveness as well as the spread of the disease.

It is considered doubtful today whether deep breathing, as formerly advised, is beneficial to the diseased lungs, it has been found that oxygen favors the growth of tubercle bacilli; violent inspiration, which are favored in some respiratory exercises, may cause the aspiration of the sputum into healthy parts of the lung and set up a chain of vicious symptoms and secondary pneumonia.

EXERCISE: If there is no sputum and the diseased area has been walled off, deeper breathing may be permitted. The expiratory phase of breathing in tuberculosis is longer than the inspiratory. The best respiratory method consists of breathing in slowly and not too deeply, prolonging the inspiratory phase, and then expelling the air again without effort.

Exercises taken at rest, preferably in bed, are a real benefit, as when a patient is confined to bed over a long period, he is liable to lose strength. Passive exercises should be taken half hour after morning meal and just before bedtime: have patient lie flat on his back and remove the pillows.

DIET: The method of feeding is as important as the quantity and quality of the food, which should be appetizingly cooked and daintily served. The greatest variation possible, even in the matter of serving milk should be practiced.

The stomach and intestines of patients who lie still all day, if kept ever full, become enfeebled in their action and dilatations readily occur.

If digestion is not disturbed, the patient should be placed on ordinary fare. When a patient is placed in bed in a sanatorium, with his mind free from the usual domestic problems, it is surprising how much he can eat, and how well he can digest his food. When at home he probably exercised beyond his strength, or was too tired to eat regularly, and probably did not have the proper food. In a case of this sort, give patient what and as much as he wants. After a time he is "filled up." He has made up his deficit, and then you must be alive to the danger of surfeit.

Some patients will have enjoyed the opportunity to rest, and have had an abundance of good food to tempt their appetites. They have no true deficit to make up. To overfeed such patients would be an error.

When you encounter a patient who does not tolerate, or rather will not eat the ordinary articles of food, you must contrive some form of regime to meet the problem, and your menu need not be in perfect accord with the theoretical indications of our laboratory physiological experts. Tuberculous patients who are not eating at all must be made to take food. A beginning must be made with something they can be induced to accept—whatever it may happen to be. Gradually the digestive functions pick up, and the best foods can then be selected. But at the start, *the best foods consist of anything that the patient will take and digest.*

CLOTHING: Clothing must be light, warm and loose. Chilled feet are as harmful as wet feet. Some nurses forget that there are hot bottles available for use of patients, and negligently permit patient's body to expend heat and vitality warming cold bed clothing.

BATH: Sponge patient's body every night, in a warm room, with warm water, followed by friction with a rough towel.

DRUG THERAPY: No drug has ever been found that had any material effect in impairing the activity of the tubercle bacillus, but numerous drugs are known which have had an injurious effect upon the patient.

The following remedies are useful as they exert an influence upon the general nutrition, thus increasing the physiological resistance to the invasion.

(1) Creosote, (2) Cod Liver Oil, (3) Arsenic, Fowlers solution, (4) Mineral salts.

On all sides investigations are being made for the long sought specific, and assuredly success will follow the labors of our men of science. Biological researches is the favorite field of inquiry, and merits the space we give in the following pages.

Biological and Tuberculin Therapy

Many persons harbor bacteria, some escape infection, while others catch it. Why?

Bacteria require food. Some (saprophytes) utilize dead material; others—the pathogenic variety—attack and break down living tissues, and develop on it. They secrete ferments which dissolve tissues rendering it suitable for their food. To accomplish this certain factors are essential—virulence of bacteria, suitable temperature, and receptivity of host, etc. If these conditions are unfavorable, the parasites do not develop, the body resists that infection. An immunity to that particular bacteria is, therefore, said to exist.

BIOLOGICAL THERAPY: Biology was termed the science of life by Treviranus in 1802, and today biological therapy covers an analysis of the origin of disease and the manifestation termed *immunity*, which is the resistance offered by the body cells to bacterial invasion. Biological therapy as now practiced is based on the fact it is possible to produce immune bodies in different animals, similar to the methods elaborated by human bodies in protecting the body against disease.

In the treatment of dangerous infections, the patient is supplied with an immune serum from an animal which has been immunized and in this way he is furnished with a very powerful protective agent.

INFECTION: Means the successful multiplication of bacteria, which have gained entrance into the human body, causing later development of disease.

TOXINS: Are poisonous effects chemically produced by bacteria, and are divided into three classes:

1 Exotoxins: Toxins given off by the bacteria into the circulation.

2 Endotoxins: Are only liberated upon death and disintegration of parasite.

3 Protein residues: Present in all bacteria after removal of 1 and 2.

IMMUNITY: A lack of susceptibility to bacterial disease, is termed *immunity*. It also implies the possession of resistance to overcome its effect when infected. Immunity may be classed as

Natural: That which exists at birth.

Acquired: When obtained by having had one attack of an infectious disease it is termed "Naturally acquired immunity," but when gained artificially it may be either "active" or "passive."

Active: Patient receives injection of dead bacteria, and he develops the protective substances.

Passive: Patient receives an infection of the protective substances.

PHAGOCYTOSIS: Leucocytes (white blood corpuscles) float in the blood performing various functions, chiefly that of destroying many foreign substances. Bacteria are foreign substances and when they enter the body with hostile intent, the body mobilizes the leucocytes at the site of infection, as the blood containing them passes by. They tend to kill and remove the bacteria by surrounding and digesting them. During the battle many leucocytes are killed by the toxins of the bacteria, and their bodies, with the dead bacteria, and broken down tissue cells, contribute to the formation of pus.

ANTIBODIES: Are protective substances found in the blood serum, the origin of their production is unknown.

Agglutination: Serum from an immune person will frequently cause bacteria, of the same kind against which the person is immune, to collect in clumps—agglutination.

Precipitans: Are substances which cause bacteria culture filtrates, when mixed with blood serum to form precipitates.

Bacteriolysins: Are substances which cause bacteria to swell up, become granular, finally undergoing a complete solution.

OPSONINS: Are the antibodies which render bacteria susceptible to phagocytosis. They are found in normal blood.

COMPLEMENT: Is present in immune and non-immune serum. It completes the factors necessary for the interaction between bacteria and antibodies.

ANTI-TOXIN: Certain bacteria excrete soluble toxins. A serum that will act as an antidote and will neutralize a specific toxin is known as an antitoxin, which is an immune serum of an animal which has been infected with killed or live cultures, or with the toxin of a specific bacterium, which developed protective or immune bodies in the blood stream of that animal.

BACTERIAL VACCINES: Are killed cultures of specific bacteria suspended in physiological saline solution. The injection of killed bacteria is supposed to grant an immunity against attacks of that micro-organism. This is termed *preventive* immunization.

Stock Vaccines: Are made from cultures of bacteria kept alive in the laboratory.

Autogenous Vaccines: Are prepared from a culture of bacteria obtained from the individual to be treated.

SERUM SICKNESS AND ANAPHYLAXIS: A condition due to the sensitization of the body to the proteins present in alien serum, and is a symptom complex of severe shock, sometimes resulting in death.

TUBERCULIN REACTION: When tubercle bacilli gain access to the body and develop toxins, which are absorbed into the blood, before any lesion can be detected in the lung, or tubercle bacilli in the sputum, and with such a patient who presents clinically suspicious symptoms of tuberculosis, some writers advise the injection of 5.m gm. of tuberculin, as a positive reaction in 24 hours would indicate the presence of a tuberculous lesion somewhere in the body. Conversely a negative reaction demonstrates freedom from that disease through immunity factors in the blood serum. (In the living body there is no such thing as blood serum, it exists only in the blood outside of the body).

In spite of its many dangers and failures, the use of tuberculin has not passed into oblivion, it is prepared by growing for 4-6 weeks a pure culture of bacillus tuberculosis in 5% glycerine bouillon. This is filtered and the filtrate evaporated to 1/10 of its volume. There are several methods of employment:

INJECTION OF TUBERCULIN SUBCUTANEOUSLY. The temperature of the patient having been recorded every four hours for three days previously, an injection of .001 gramme of original tuberculin in 5% solution of carbolic acid is given deeply into the gluteal muscle. In positive cases the temperature rises 2 to 3 degrees or more in 5 to 24 hours, and there is headache, with malaise and increased rapidity of the pulse. No effect is produced in a healthy person. Its contra-indications are: Fever, hemoptysis, hematuria, cardrae or renal affection, arterio-sclerosis and diabetes.

VON PIRQUET'S REACTION: This is elicited by vaccinating the skin with a solution of tuberculin, which is followed in a tuberculous subject by surrounding inflammation of the skin, but has no effect in health. In adults it has no value, 70% of all persons give a reaction. It has some value in children under 10 years of age.

CALMETTE'S REACTION: A few drops of a solution of tuberculin, preferably that prepared for this purpose, are instilled into the conjunctival sac of one eye. If the patient is tuberculous, this is followed in twenty-four hours by a marked inflammatory reaction, which subsides in two days; in a healthy subject no effect is produced. Positively contra indicated in all diseases of the eye, tuberculous or otherwise.

"The subcutaneous tuberculin reaction has, with the majority of clinicians, proved of little prognostic value, and the same may be said of other tuberculin tests."

Knopf, Reference handbook Med. Sciences, Vol. 6.

HEMOPTYSIS: When patients are cared for in a well-conducted sanatorium, pulmonary hemmorhage is a rare event. In my experience particularly in outside practice hemoptysis was always due to sudden changes in temperature, or exposure of patient to excessive cold, which increased the volume of blood passed per minute by the heart into the circulation, and due to the increase, the small artery and capillaries of the diseased portion of the lung would be more likely to rupture. The blood vessels of the lungs are not supplied with vaso-motor nerves, and an increase in the amount of blood passing through the lungs will be accompanied by an increase of blood pressure in the arteries.

This condition is due to faulty nursing, or improper, or negligent care of patient.

Take the temperature in those cases, but refrain from auscultation, it yields no information, and is an improper proceeding as it disturbs the patient, who is usually requested to breathe deeply, which incites coughing.

Advise patient against talking and keep him cool and quiet. Talk re-assuringly in low tones, and give him a few spoonfuls of cold water to drink.

When confronted with a pulmonary hemmorhage, apply heat to the extremities and give patient a hypo of morphine to allay his anxiety and quiet your own fears.

DOUBTFUL DIAGNOSIS: Where a positive diagnosis of any disease cannot be made, prescribe a modified tuberculosis treatment—Fresh air, proper food, rest—Never mention the word consumption or tuberculosis to these patients, except by way of warning them of eventualities that are possible. A therapy that approximates that for tuberculosis will undoubtedly save much illness, suffering and probably some lives.

The few really valuable adjuncts in the treatment of tuberculosis other than rest, graduated exercise, good food, fresh air, and proper medical supervision are:

1. Pneumothorax.
2. Heliotherapy.
3. Thoracoplasty.
4. Immobilization of affected side by a so called lung splint.

Glands of Internal Secretion

(Concluded from page 56)

velopment in association with pituitary deficiency. He points out the frequency of nocturnal enuresis and fits occurring in adolescence in association with other frank pituitary manifestations, or with a *formes frustes* type.

He presents three cases: (1) Acormegaly with subsequent Fröhlich's manifestations and genital atrophy, occurring in adult life, with erosion of the sella turcica; (2) a case of classical Fröhlich syndrome with epileptic fits; (3) three brothers with hereditary dyspituitarism, with marked genital atrophy, the mother of whom showed similar symptoms of dyspituitarism.

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The Primary Contracted Kidney*

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It is with a great deal of trepidation that one attempts to enter into any presentation in reference to the kidney. This timidity can be attributed in the greater part to the generally unsettled feeling held in reference to the classification of kidney diseases.

During the last ten years, great advance has been made in the diagnosis, determination of the prognosis and the correlation between the findings of the pathologist and the internist, with less progress in the therapy. The result has been that we have classifications offered to us as seen from the pathological, clinical, bio-chemical, and from a combination of the aforementioned standpoints.

With the advent and progress of bio-chemistry, we have been afforded a means of greatest potency in aiding us in our renal interpretations. However, just as the naked eye is inadequate in comparison with the microscope, so are our bio-chemical methods of today inadequate in relation to our bio-chemical methods of tomorrow.

Further improvement, evidently, is possible in diagnostic precision, timeliness, and completeness of understanding in reference to the kidney, which can be afforded only by steady and painstaking investigation.

Harking back to the elementary textbook explanation of the function of the kidney, it may be recalled to mind that it is classed as a filter of the waste products of the blood. A simple, understandable definition of the nephritides in the light of the present knowledge, can very well be summed up as: "The inability of the kidneys to concentrate."

With the constantly shifting and varying interpretations of the numerous classifications of renal disease, none of which we feel at the present time to be comprehensive and exact, it behooves us to specify, preferably from a pathological standpoint, what we mean by the primary contracted kidney. This kidney, called in the older classification, the chronic interstitial nephritis kidney, or the primarily contracted kidney, or the kidney of malignant sclerosis, is recognized by Aschoff as Arteriolosclerotic Nephrocirrhosis.

In brief, our pathological picture is that of a renal ischemia. In this condition we are dealing with a gradual progressively advancing lack of blood supply to the kidney, with the result that in the end stage we find a general renal sclerosis. This affects the intermediary and finer arterial vessels, with resultant fibrosis of their corresponding glomeruli, with still further distintegration of their tubules. Attendant upon this diffuse fibrosis, as a result of connective tissue changes, we are presented, finally, with the so-called contracted kidney.

Almost always the process is bilateral. There are probably occasional exceptions to this statement, as has been suggested by Senator and Klemperer.

Grossly, the color of the kidney is variable, but is generally a gray or reddish gray in color, slightly or markedly smaller than normal. In the long standing cases there may be extreme reduction in size. Cases have been reported to weigh as little as 50 to 60 grams. It is firm to the touch, and the capsule is generally removed with difficulty. Very frequently when the capsule is forcibly removed, more or less kidney substance is pulled away with it, leaving a rough, granular, uneven, reddish surface, that is quite characteristic. The fatty tissue about the kidney is usually abundant and may be quite firmly adherent to the true fibrous capsule. This latter is often quite vascular, is thickened, and raised in an uneven manner, due to underlying contracting fibrous tissue.

Upon section, the cut arteries may be plainly seen, may gape and show thickened walls. The cortex is narrow. In some places the pyramids lie almost immediately under the capsule. The pyramids, although shrunken, seem, by comparison with the contracted cortex, to be large.

Microscopic examination reveals a general increase in this fibrous tissue, a thickening of the vessel walls, a destruction of glomeruli, and more or less distintegration of the renal epithelium. Many glomeruli are destroyed, being represented by structureless, hyaline elements, or by fibrotic masses. The capsular space may be obliterated.

In the tubules, atrophy is more or less marked. Many tubules are narrow and quite collapsed, others will present retention cyst formation, probably due to blocking of the excretory ducts. In some tubules, all the cells have disappeared, leaving bare the basement membrane. In reference to the vessels, an endarteritis can usually be made out with intimal thickening and often perceptible narrowing of the lumen. The small intertubular vessels are especially involved, and are often obliterated. Hence Aschoff's nomenclature of Arteriolosclerotic Nephritis. In reference to the interstitial tissue, this is markedly increased and generally haphazardly tends to infiltrate any or all portions of the kidney.

Concerning ourselves with the histology of the kidney, and bearing in mind at the same time the intermediate etiology, namely, sclerosis, it stands to reason that the frequency of the occurrence of this type of renal disease, producing subjective or objective symptoms, or laboratory information is relatively less common than the other forms of renal impairment.

Almost invariably, associated with this type of renal disease, are generalized arteriosclerosis and cardiac hypertrophy. The cardiac hypertrophy has generally been especially noted in the left ventricle, although in advanced cases there is an increase in all diameters. Heretofore, much discussion has taken place in reference to the associated changes in the heart and the blood vessels, with relation to renal changes. With our steadily shifting view point in reference to sclerotic etiology, definition of explanation has not yet been attained. In a number of cases this renal condition has been diagnosed, and latterly confirmed by autopsy findings, in the absence of further sclerosis in other portions of the body, such as peripheral vessels, retinal changes, and clinical cardiac changes.

The present-day feeling in reference to the sites of predilection of arteriosclerosis, is that evidence is found in the spleen, kidney, and pancreas, in many cases which fail to reveal vascular changes elsewhere in the body. Hence, the difficulties that await us when attempting to make an accurate diagnosis.

The etiology of the condition of arteriolosclerotic nephrocirrhosis is identical, naturally, with the etiology of general arteriosclerosis, i.e., lead, gout, syphilis, alcohol, heredity, severe muscular strain, overwork, worry,

*Read before The Medical Association of the Greater City of New York, November 18, 1926.

as well as chronic toxemia. According to Rosenstein, the overwhelming majority of cases of genuine contracted kidney present no determined etiology. In reference to heredity, it appears as though there is present a familial tendency. Chronic fibroid changes may take place in the kidney when there is a chronic obstruction to the outflow of urine.. While this is not, in a strict sense, the same type as the contracted kidney, this "consecutive nephritis" may be here referred to as it is practically a fibrosis.

The clinical picture, as presented by this syndrome, comes more frequently under the observation of the hospital worker, or the attending internist, rather than that of the general practitioner.

It stands to reason that the age incidence in this type of kidney disturbance is during the latter part of life, rather than in the earlier decades. According to Osler, the arteriolosclerotic nephritis kidney, in the strictest sense, is rarely seen until after 45, although this entity has been found present as early as between 20 and 30 years of age.

Historically. there is generally little or nothing to suggest the likelihood of pre-existing renal insult. Many cases are latent and are not recognized until the occurrence of one of the serious or fatal complications. A most advanced stage of contracted kidney may be compatible with great mental and bodily activity. There may have been no symptoms whatsoever of a nature to suggest to the patient the existence of a serious malady. In other cases, the general health is disturbed, but generally in a relatively minor way. The disturbance may take form in lassitude, insomnia, nocturia, disturbed digestion, headache (generally of the basilar type), failing vision or breathlessness on exertion. In addition to these symptoms, in our experience, the most frequent complaints tend to be associated with myocardial failure.

So complex and varied is the clinical picture of this form of renal disturbance, that it would take unnecessary time to dwell upon each and every likely complaint. The outstanding features are:

First:—Disturbance of the urinary system.

Polyuria is common. Frequently the patient has to get up two or three times during the night to empty the bladder, and it is for this symptom alone, usually, that relief is sought. This symptom itself is not, however, specifically suggestive of the entity dealt with.

Secondly:—Disturbance of the circulatory system.

The circulatory symptoms complained of as previously mentioned, have to do with myocardial insufficiency and impoverished cerebral blood supply. The symptoms complained of are likely to be dizziness, dyspnea, orthopnea, palpitation, precordial stress, and basilar headaches. Edema is not common. A slight puffiness of the ankles may be present, but in the majority of cases, dropsy does not supervene. When extensive, it is almost always a result of gradual failure of the hypertrophied heart. Hemorrhages are not infrequent. Epistaxis, the most common type of hemorrhage encountered, may prove serious, and extensive purpura may occur. Ascites is rare, except in association with cirrhosis of the liver.

It must be understood, bearing in mind that the entity being discussed represents a gradual, insidious progressive condition, that the symptomatology is exceedingly variable, and occurs progressively over a long period of years. The presented symptoms may even be more or less relegated to the terminal stage of the condition.

In our observations, the blood pressure readings have been found as a rule over rather than under 200 systolic. So persistent has the elevation to this degree been noted in this condition, that we have become rather prone, in the past period of time, to look upon a persistent systolic reading of over 180 as being either actually, or potentially, demonstratively associated with nephro-sclerosis. Naturally, caution should be observed, in order to prevent error in interpretation. A dividing line, such as has been just mentioned, can be subjected to most severe criticism. As in many other conditions, a dogmatic rule in reference to a finding may become a two-edged sword, and result only in producing confusion and erroneous diagnosis for the interpreter. It is to be pointed out that it is not maintained that a systolic pressure reading of over 180 alone, should determine the diagnosis of the entity that we are dealing with, but it is only after consideration of the available findings, that its value becomes evident.

There are cases that have come under our observation, with very definitely determined clinical evidence of the presence of a primary contracted kidney, verified by autopsy, in which this most salient feature, namely, hypertension, has been lacking. On the other hand, the presence of a hypertension to the degree mentioned, is the rule, rather than the exception. Both reports six cases of typical contracted kidney determined upon autopsy, unassociated with generalized arteriosclerosis or cardiac hypertrophy, in most of which the blood pressure had been lower than normal.

It must also be borne in mind at this juncture, that frequently normal, or even sub-normal blood pressure readings may be found in the severest types of these cases shortly before death, which previously presented moderate or severe hypertension, but in whom, due to severe myocardial failure, there has been suffered a marked reduction in the blood pressure determinations.

Complications:

In the strictest sense, cardiac incompetence and dilatation may be regarded as the natural sequence of events, but the failing heart so often dominates the picture, modifying the findings, as well as the course of the disease, as to justify its being looked upon as a complication. True valvular disease from preceding endocarditis, is, of course, a complication in the narrower sense of the term. The associated symptoms attributable to myocardial failure, hydrothorax and other serous exudates, may likewise be looked upon as complications, with the result that frequently the picture, clinically, appears more cardiac than renal. With the approach of congestion due to myocardial breakdown, the urinary picture may be markedly changed, and mask the really serious or underlying condition, namely, that of chronic renal incompetency.

Laboratory Aspect:

In the history of the study of the kidney by various means, prior to bio-chemistry, prior to the microscope, we look back to the urinometer. Upon the introduction of the first two mentioned, and the avidity with which they were received, the urinometer very promptly tended to be relegated to an age of the past. Hence, we were making diagnoses and instituting therapy, solely upon blood findings and microscopic urine analyses, with little or no regard to the presenting clinical case. The urinometer, today, again takes its place among the various means of investigation, as one of our instruments, which, although grosser in its capabilities is not to be disregarded and from which decided information of value is to be derived.

Examination of the urine presents to the average practitioner, unless due caution is observed, a potential pitfall in this type of disease. A typical casual urinary report may be quoted as follows:

Reaction:—Acid *Microscopic:*
Spec. Grav.—1.008 Few epithelial cells.
Protein:—Faint trace. Urate crystals, etc.

A report such as the above, might very readily be utterly disregarded. An adequate but erroneous explanation might serve for each of the few abnormal findings. As a rule, in the typical case of the severest degree, this is rather a characteristic urinalysis. Casts are not the rule, but the exception. Blood and heavy traces of protein likewise. Protein, in fact, may frequently be absent. Non-albuminuric nephritis has gradually become recognized as being more common than has been taught in the past, hence repeated urine analyses, with the result that correlation with the clinical picture is indicated.

The institution at this stage, of the Mosenthal renal function test might yield us information of the greatest value. It might present to us a persistence of this low specific gravity, a pathological variation in the urinary output, as well as abnormal diurnal and nocturnal variations. Hence the suggestion as to the cognisance of the relatively despised urinometer.

Blood chemistry findings, by which I refer to Urea Nitrogen, Uric Acid, and Creatinine determinations of the venous blood, tend to yield very valuable information. As a rule, there is an elevation of the three elements, particularly in the advanced stages of the disease. Under our observation, a rather characteristic disproportion has been noted, which tends to be contrary to the findings obtained in other conditions, particularly chronic diffuse nephritis.

We have observed in the correlation of the chemical blood findings, in a limited series of cases, that there is a uniform disproportionate elevation of the creatinine in relation to the urea nitrogen in the cases of contracted kidney. One outstanding example of such an instance was in an elderly nurse, upon whom an autopsy was performed, verifying in detail our findings, in whom the urea nitrogen was 30 mgm. per 100 c.c. and the creatinine 12 mgm. per 100 c.c. This one instance is mentioned as an extreme. It can readily be seen how an incomplete conception of such a case would be derived, were only the urea nitrogen determination made. Prognosis, in this case, could be made upon the creatinine reading alone. This may serve, after more thorough investigation and confirmation, as a differential of importance.

The phenosulphophthalein test, which has lapsed in popularity of late, should not be utterly disregarded, but may be utilized to augment other information. Its lapse of popularity is dependent to a great extent upon the variability of its results. This variability can be attributed in part to the lack of standardization of the routine of procedure as well as to the variability in human assimilation. Additionally the general recognition of the value of blood chemistry in renal disease has, in itself, tended to overshadow the degree of importance of this, one of our earlier diagnostic aids.

Prognosis:

Arteriolosclerotic nephrocirrhosis is still to be regarded as an incurable disease. Recovery is certainly a rare occurrence. The period of longevity is generally undeterminable. The patient or family is certainly entitled to know from us that the progress may, in the natural course of events, be slow, and that, with proper care and observation of the general hygienic rules of life, a decided prolongation of life may be held forth. We must make it understood that a kidney, although hopelessly diseased anatomically, may function for a considerable length of time and render the patient capable of useful existance. The termination in this type of disease, in our experience, has been of a cardio-vascular nature, rather than a renal nature. Intercurrent disease, such as pneumonia, is likely to intervene in a considerable number of cases. A cardiac death, with dyspnea or dropsy, is reserved for quite a large number.

Treatment:

It is in this type of hypertension that we have yet to make any great progress in treatment. Due to the obscurity of the etiology of the discussed entity, due to the tremendous inroad that has occurred when the condition is recognized, we cannot help but consider whatever therapy is instituted to be one that is of a palliative nature.

Recognizing the pathology, course, and prognosis of this entity, as well as the general nature of termination, that is to say, cardio-vascular in character, it behooves us to turn our attention essentially to the control of what is probably the most serious offending factor, hypertension.

Irrespective of the fact that we are constantly deluged with reprints and miscellaneous literature advocating one preparation or another, one system of regime or another, or some specific type or diet, we must admit with pardonable chagrin, that little progress has been made in this type of hypertension to any material degree, by any means heretofore proposed or suggested.

It is this type of case that enters our hospitals with the main view to having the offending pressure reduced, and which, at the termination of their stay under the most conscientious and painstaking direction, leave with a pressure of 180 systolic, or above.

Considerable progress is made, however, in these cases, in reducing the blood pressure somewhat, depending to a great extent upon the height to which it has ascended. Eradication of offending foci, maintenance of mental and physical rest, reduction of weight in those necessitating it, maintenance of properly balanced dietary regime, absence of general body stimulants or irritants, and institution of means to promote proper elimination of accumulating or accumulated toxins, all tend, each in its individual way, to produce some amelioration of the degree of hypertension with a resultant production of a greater sense of well being.

Summary:

In summarizing, attention is called to the following:

Diagnosis of primary contracted kidney should not be made hastily, and only after careful and conscientious observation of the patient in conjunction with reliable laboratory data.

Presence of the primary contracted kidney is a great deal more prevalent than is generally supposed.

More attention should be paid to the urinometer and what it may portend.

An apparently normal urinalysis, void of protein, casts, etc., does not militate against the presence of the entity discussed.

Determination of the urea nitrogen of the blood alone may serve to produce undue confidence and lean to incorrect diagnosis and prognosis.

Blood pressure readings of 180 above should receive serious consideration with particular reference to the possibility of co-existing primary contracted kidney.

Full understanding of the pathology, course, and prognosis of the condition will inhibit a physician from falsely misleading himself or the patient, as to what may be accomplished by medical science.

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Two Destroyers of Woman*

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The method of procedure in a case of pyosalpinx should include the idea of consulting with the patient. The tendency among surgeons has been to assume a superior position and to follow arbitrary lines of established procedure. Established procedure for a case of pyosalpinx now unhappily includes the principles of two separate and distinct eras in surgery (the Third and Fourth Eras). The First Era of surgery was heroic. The Second Era was the Anatomical one. The Third or Pathological Era included the idea of destruction of the microbe at all costs, leaving the patient himself out of the question. The Fourth or Physiological Era on the other hand includes the idea of taking the patient's natural protective resources into account, giving "home rule" so to speak and doing the least amount of surgery which will suffice for placing the patient in position to manage the microbe with his own protective resources of phagocytosis for example.

If we are to leave a case of pyosalpinx then to "established procedure" and if we have two very separate and distinct lines of established procedure the patient will have devastating pelvic surgery applied if she employs a Third Era surgeon. Constructive surgery on the other hand would belong to her good luck if a Fourth Era surgeon is employed.

According to Third Era principles when the microbe loomed large and the physiology of the patient was left out of the reckoning Fallopian tubes were removed completely. If the swollen, ragged, bleeding mass happened to include the ovary which was difficult to distinguish that also went into the slop pail. A number of abdominal surgeons even went farther than that when hypnotized by the microbe. They argued that if tubes and ovaries were to be removed the infected uterus, no longer of value, might as well be removed.

Here we have two destroyers at work upon one woman. The first was the man who gave her the gonococcus; the second was the surgeon who acted like the ape in its attempt at destroying a fly upon the forehead of his sleeping master, using a large stone for the purpose. For "fly" read "microbe"; for "stone" read "Third Era Surgery."

The Fourth Era surgeon remembers that patients sometimes recovered from pyosalpinx without any surgical operation at all and even bore children later although some of the pregnancies were extra-uterine. The mere fact that some of the patients bore some children after recovery from pyosalpinx means that something did it. What did it? The patient, with the aid of her physiology. Such being the case the Fourth Era surgeon takes the hint, makes use of the physiology of the patient and merely eases the ways. The Fourth Era surgeon instead of removing tubes and ovaries and perhaps uterus simply splits the tubes wide open in order to insure good drainage. These tubes which are split wide open are sutured to the anterior abdominal wall at a convenient place for putting in a little drain so that the tubes will drain to the surface for awhile. The infected uterus itself is treated by the Marion Sims method. It includes the idea of using an astringent hygroscopic fluid upon tampons applied to the cervix. This treatment empties the walls of the uterus of infiltrates and shrinks the uterus to such a point that the gonococcus does not rapidly thrive in the lumen.

The next step in order is to employ stock vaccines until all traces of infection have disappeared. When that time comes a simple secondary operation is performed which liberates the tubes from the anterior abdominal wall to which they had been fixed for purposes of drainage. At this second operation the tubes which were split wide open originally will be found to have assumed a round shape again. Fimbriae are all ready for development or even have developed at the ends of the oviducts where no fimbriae were in sight at the time of the first operation. The patient is then ready to bear children again. She is informed that some pregnancies may be extra-uterine but that need worry her very little because surgeons know just what to do in such cases.

The woman in such a case has been attacked by one destroyer only, the one who gave her the gonococcus. There has been no second destroyer in the form of a Third Era surgeon.

The case which brought this subject into mind this evening included another factor altogether, the question of whole procedure which took the patient into account. The patient herself was taken into consultation and given a description of the difference between Third Era surgery and Fourth Era surgery in pyosalpinx. In this particular case the patient's own decision was in favor of Third Era surgery on the ground that her husband as a sporty man about town had given her syphilis at the same time that he gave her gonorrhoea. Furthermore there was insanity in her own family. Her preference was to have her tubes out leaving the ovaries in order to avoid menopause at her age. Her statement was that she would prefer to adopt children, giving them a good home and education instead of having any of her own. Much to my regret I consented to do Third Era surgery for her in view of her expressed wish based upon grounds of her syphilis and of psychosis in the family.

Upon my return to the office I found on my desk a letter from a young wife in California who also had been disillusioned on the subject of sporty husbands. Her letter states that she was infected with gonorrhoea by her husband immediately after marriage and was obliged to have both Fallopian tubes removed. This patient writes that she is thoroughly heartbroken as her ideals in life included good wifehood and good motherhood. She states that she would willing go through anything or pay almost anything for surgical services if it were possible to have constructive work done which would allow her to have children. My reply was to the effect that grafting upon her uterus the fimbriated end of an oviduct from another woman might possibly allow pregnancy to occur if the lumen at the cornu of the uterus were to remain open, and if the graft did not become absorbed too rapidly. I advised that these two essential features were so likely to result in failure of the operation that my judgment would be against operation excepting on the ground that it would be understood to be highly experimental.

(Concluded on page 74)

*A case report at the meeting of the New York Medical Union, November 23rd, 1926.

**The New York Medical Union is one of the social medical societies meeting at the homes of different members. A feature of the program consists in each member being called upon to make a report of the last case seen that day no matter what it was although privilege is given of making a choice of some other case.

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Culture and the Endocrines

E. H. Hume, in his study of "The Contributions of China to the Science and Art of Medicine" (*Science*, 1924, vol. lix, p. 345), informs us that massage was recognized in China as a therapeutic measure more than 1,500 years ago, that inoculation for smallpox was initiated 1,200 years ago, and that as early as the seventh century A.D. sheeps' thyroids were administered for cretinism. These facts tend to temper our own pride and complacency somewhat. A partial explanation as to why so little progress followed such remarkable discoveries as have been noted is offered by E. V. Cowdry, of the Rockefeller Institute. He points out that China has always produced exceptional individuals endowed with extraordinary intellectual powers, while the nation at large always remains impassive and uninterested in the work of its geniuses because, probably, of the very low metabolic rate of the people in general. The masses of the Chinese have a lower grade of thyroid activity than Europeans. Even their blood pressure is low. There is much evidence to show hypofunction of the pituitary, thyroid, suprarenal and interstitial glands as an ethnical characteristic, which would tend to explain Chinese apathy. Even the invention of gunpowder, glass, various metallic alloys, the compass, paper and printing, and the discovery of coal, failed to excite social reactions that would inevitably follow in people like Europeans and Americans. The vitality of the Chinese was originally depressed by invasions, droughts, floods, famines and epidemics without parallel in severity elsewhere (Ellsworth Huntington).

Paroling the Insane

It is an interesting fact that insane "patients on parole commit less crime than a like number of sane people of the same age distribution." This has been found to be the case in New York, according to studies made by the Statistical Bureau of the New York State Hospital Commission at Albany.

In the civil State hospitals on June 30, 1926, there were 41,337 resident patients and 3,083 patients on parole, or something over seven per cent. The time limit of a parole is one year, governed by general conditions laid down by law.

The parole system has grown as clinics have been developed and as more social workers have become available. "The mental clinic is an essential factor in any well-organized parole system." One social worker supervises each hundred patients on parole in cities, or each seventy-five in rural districts.

The parole system is humane and effective, readjusting large numbers of individuals to normal community life.

The modern desire is that mental hospitals should be curative rather than custodial institutions. Unless they work to restore disordered minds there is no good reason for their existence in this enlightened age. This *is* the object of all the treatment given by them.

The trouble is that all humaneness and knowledge as to the foregoing facts tend to be supplanted by hysteria whenever a Noel case occurs. If the truth set forth in our opening paragraph could be made to stick strongly enough in the minds of the public and its spokesmen the enemies of the system would be unable to exploit this hysteria at opportune times.

A Belated Adjustment

While only about 3,000,000 gallons of whisky are now used annually on regular prescription, about seven millions of bootleg liquor are used in addition by the sick. Some measure should be put into effect which would supply all legitimate requirements in decent fashion.

The trouble that will beset any plan, however, is that patients and their relatives and friends have been obliged to procure much bootleg liquor because of official red tape, and this intensive education has been the worst sort of preparation for a rational program of any sort.

From the standpoint of the patient this whole matter has been badly bungled from the beginning. Much harm has been done to the ill and to the cause of real temperance by fanatics possessing, as has been ably pointed out by Dr. E. T. Burke in his "Scourges of Today," exactly the same nervous instability that produces the inebriate.

Dr. Charles H. Mayo is still optimistic. He remarks that "The time will come soon when a real method of sensible control and regulation, which will be fair and just, will be adopted. There will be a change. But this change must first take place in the hearts of the people. Of course, National Prohibition has brought about a condition which is not as satisfactory as that of local Prohibition regulated by the individual States. Local option was a good rule."

Paranoia and War

The modern psychiatric view of paranoia inclines to regard it as the result of "projection" phenomena originating in homosexuality. The conflict which is staged in the mind of the victim results in a defensive inversion of attitudes, so that hatred and fear of attractive

men supplant love, thus giving rise to delusions of persecution.

By no great stretch of the imagination one may apply the same principles of psychiatry to the origins of war. The mechanisms whereby war is staged play upon the minds of the masses by the same process of inversion. By this token it is those whom we love most whom we can be made most to fear and hate.

The conflict leading to paranoia implies individual craziness, while the conflict leading to war implies mass craziness.

The fault which is inherent in the homosexual is inherent in the nations in their relations to each other, since "internationalism" is regarded in many quarters as evincing a kind of civic turpitude quite as deplorable as homosexuality. Patriotism, or even chauvinism, is the admired virtue in the national life, while the individual who in his psycho-sexual life loves himself alone may be a highly respected citizen of the State, even if his frailty (?) be known.

When the regard in which one nation holds another passes a certain point nothing but war offers a remedy against the threat to patriotism, just as when the regard in which one individual holds another of the same sex passes a certain point nothing but the most summary methods offer a remedy against the threat to morals and social stability.

The point is that the factors making for war possess resemblances to those making for paranoia.

In this light such phrases as "the insanity of war" become more significant.

If our premises are sound there would seem to be small likelihood of ever outlawing war, so long as the human mind remains so sensitive to influences inspired by our present political ideals, assuming the permanence of such ideals.

Crowd Infection

It is sometimes said that we have reached a peak in our preventive medicine beyond which we cannot much farther go unless the people can be induced to make a more intensive application of the principles of personal hygiene. But along comes a force which, while it cannot stay the pull of the industrial world which drags the people out of their homes to work, at least tends to hold them in their homes for recreation. The more complete development of radio broadcasting and of television will provide every home with its own opera, comedy, lyceum, ringside and stadium. When that day comes, and it is very near, the transportation of evening crowds and the entertainment of evening crowds outside of the home will be measurably less intensive problems. In so far as these advances in science tend to lessen the massing of mobs in so far will there be a drop in the incidence of infection. And since we have a right to believe that there will be betterment with respect to personal hygiene we have, it will be seen, much reason to look forward rather optimistically to a general lessening of infection of all types within ten years. It is also to be supposed that such advances as seem promised through further study of the *Bacterium pneumosintes* will insure a far better control of common colds and influenza.

Glentworth Reeve Butler

Dr. Butler's life was a full one. As practitioner, consultant, scholar, soldier and man he functioned brilliantly over long years, although at the end he had not attained great age—nothing in itself—but the work of the good and faithful servant was done, and well done.

The roots of his trend toward scholarship may be discerned in the father—Reverend James Glentworth Butler, author of a famous eleven-volume commentary on the Bible and of exegetical works of a high order. The "Diagnostics of Internal Medicine" was an achievement equally great in the domain of medicine.

We think of Dr. Butler chiefly, perhaps, as one of that extraordinary Methodist-Episcopal Hospital triumvirate: Glentworth Reeve Butler, Lewis Stephen Pilcher, and George Ryerson Fowler. What a trio of Olympians! lifting the fame of that Brooklyn hospital, unassociated with medical school or university, to the highest conceivable point of distinction.

Henley's lines fit Dr. Butler well:

"THE CHIEF"

His brow spreads large and placid, and his eye
Is deep and bright, with steady looks that still.
Soft lines of tranquil thought his face fulfill—
His face at once benign and proud and shy.
If envy scout, if ignorance deny,
His faultless patience, his unyielding will,
Beautiful gentleness and splendid skill,
Innumerable gratitudes reply.
His wise, rare smile is sweet with certainties,
And seems in all his patients to compel
Such love and faith as failure cannot quell.
We hold him for another Herakles,
Battling with custom, prejudice, disease,
As once the son of Zeus with Death and Hell.

Gasper Salvatore Pendola

Behind the strangling and stabbing arm of Caruso, the wretched killer of Dr. Pendola, lay all the ignorance and all the malice of ten thousand fanatics.

For Caruso is merely the symbol of the prejudice and hate and untruth that inspire opposition to science in its most beneficent phase.

One is moved to hope that this lamentable death, so poignant in its nature and significance to enlightened men, may have served some purpose helpful to the antitoxin campaign.

Through the instrumentality of the lay press, the crime was reported in a manner calculated to illuminate brilliantly the festering thing which is at the root of all lingering resistance to what is now to all reasonable minds, demonstrated truth.

In so far as this reporting revealed Caruso as typifying ignorance and prejudice in overt action, it may be said to have focussed dramatically the propaganda for antitoxin, and should serve to silence most of the malodorous crowd whose appeals to passion and prejudice arm such assassins as Caruso and activate a million morons besides.

Yet let it not be forgotten that one representative of the fetid tabloids has applauded the murder and the murderer.

Verily our state of civilization is none too exalted.

Facial Reconstructive Surgery

(Concluded from page 60)

6. Gillies, H. D.: Deformities of a Syphilitic Nose. *British Med. Jour.* Nov., 1923.
7. Gillies, H. D.: Plastic Surgery of the Face. *Oxford University Press*, 1921.
8. Eitner, E.: Zur cosmetik der sogenanten Paraffinoms. *Med. Klin.*, 1919 V. 15 p. 76.
9. Van Gelderen.: Histologische Verenderungen in Subcutanen Bindgewebe nach Subcut. Paraffin Injection. Berlin, 1925. CCIVii. 805-814. Virchow's *Arch. fur Patholog. Anatomie.*

258 Riverside Drive.

Miscellany

Medical Work in Syria*

JOHN W. SHUMAN, M.D., F.A.C.P.
Formerly Prof.—Med., Amer. Univ. of Beirut, Syria; Associate Professor Medicine, Medical Department Loma Linda University
Los Angeles

During the school year of 1922-23 the Medical Department of the American University, of Beirut, Syria, studied five hundred patients in the hospital and thirty-one hundred in the outpatient department. This report deals particularly with the five hundred male and female adult hospitalized patients. The hospital was composed of four buildings of the pavilion type, and is a part of the medical department of the university. The number of beds in use by all departments was 165. Twenty-two beds were allotted to the medical service; these at stress times were supplemented by floor cots.

Each patient was examined by a fourth-year, assisted by a third-year, medical student, supervised by the first assistant, George Khayatt, and reported at the bedside to either myself or the adjunct professor of medicine, Joseph Yennikomshion. The average time each patient spent in the hospital was eleven and one-half days. Thirty-six per cent of the five hundred patients were females and sixty-four per cent males. The predominance of men may be accounted for by the fact that about two-thirds of the Syrians are Moslems; and the Mohammedan women do not accept hospital service as readily as their Christian sisters.

The raising of the general health standard of people, thereby increasing their general usefulness and happiness, is certainly a Christian act. This is the aim of those who are doing medical missionary work in Syria, for it is fully realized that this elevating act must be done through sanitation and health service to prevent disease; all of which involves housing, labor, and private and public enterprise, etc., for conserving health.

Twenty-seven patients of the five hundred died. Autopsies were performed on twenty-five, which demonstrates how well the newly organized pathological service of Douglass Cruickshank and our assistants worked in securing autopsies. While autopsies are not popular in any country this is particularly true of Syria, for the burial teachings of Moses are still believed by Moslem and Jew (Deuteronomy). During the previous year but three autopsies were held from the same medical service.

Of the five hundred admitted to the hospital, eighty-six were listed as transferred and unimproved; the transferred included those sent to other services and other hospitals. The remaining four hundred and fourteen were charted as arrested, improved, or recovered; the word "cure" was never permitted. For example, a malaria infection was arrested; a focal infection sufferer improved; and when a typhoid fever patient left the hospital convalescing, recovery was charted.

That we were handicapped in our work is readily admitted; most missionary institutions are handicapped. The greatest handicap was the lack of facilities to work out the diagnosis properly. When I went to Beirut the laboratories (aid in diagnostic medicine) were as follows: There was no fulltime pathologist; the hospital bacteriologist was the instructor in the practical course of physiology as well as the adjunct professor of internal medicine (the latter title without duties); the X-ray apparatus was of an obsolete type nineteen years old, and at so great a distance from the medical building that it was impractical to transport patients to it. But no difficulties were insurmountable and I am happy to state that the medical school is getting along fast towards an A plus rating.

Uniform history charts and records for all services, like those used in standardized American hospitals, were recommended and introduced. During the previous year, one hundred and eighty patients were admitted to the medical service, against the five hundred herein reported, which helps to demonstrate the growth of the work.

It was not long before we were able to obtain regular Wassermanns, agglutinins, for typhoid and typhus, complement fixation for hydatid cyst, tuberculin, and other tests, from the hospital clinical laboratory. The native doctors and students and most of my colleagues were enthusiastic for the methods of modern medicine, especially the thorough examination of the patient before a diagnosis.

*Reprinted in part from *Medical Journal and Record*, V. 121, No. 7, p. 395, April 1, 1926.

Report of the House Committee of the Physicians' Home Caneadea, N. Y., for the Year 1926.

At the Annual Meeting of the Physicians' Home, Inc., the House Committee made the following report, which gives in detail the progress of improvements made during the year 1926 at the Caneadea Unit:

1. The enlargement of the Home by the addition of a new and modern Sanitary Kitchen combined with Refrigerator Room and Cold Storage Room.
2. Complete Bathroom with Shower for use of Help.
3. A new Dining Room with Elevator Service from the Kitchen.
4. The establishment and equipment of a Physician's Office for the Physician, who is in attendance to the Guests at the Home.
5. The erection of a Cottage for the Physicians' Home Farmer.
6. The erection of a Physicians' Home Sign of Concrete, Iron and Copper.
7. The erection of a two-car garage and work-shop.
8. The application of Stucco to the entire Home Building.
9. A small start was made in the work of landscaping the grounds; many shrubs and 75 butternut, 25 hickory nut and 10 pecan nut trees were added to the nut grove started two years ago.
10. On Grounds East of Home we have added for recreation and exercise one Official Croquet Court, two Official Quoit Courts, and one Archery Court with small house attached to hold equipment of archery, mallets, balls, quoits and accessories.
11. The Electric Line Extension extending from the main line at Caneadea to the Home is under construction. At this date, the poles have been erected over the first one-half mile of the way.

The improvements as enumerated and completed in this report are paid in full. During this year we feel that we have made better progress, had better organization and given better service than any previous year. We wish to take this opportunity to thank our Board for the cooperation given and we have good hopes for an organization of increasing strength and harmony, which in 1927 will bring us the financial success needed for our progress.

Respectfully,
WILLIAM H. DIEFFENBACH, M.D.
RALPH WALDO, M.D.
STEPHEN V. MOUNTAIN, M.D.
House Committee.

Two Destroyers of Woman

(Concluded from page 72)

The point which I wish to make in quoting this second case is that this young woman had been attacked by two destroyers, the man who gave her gonorrhoea and the surgeon who performed a Third Era operation leaving a heartbroken woman who might have been put in the way of having a number of children of her own had she fallen into the hands of a Fourth Era surgeon.

114 East 54th Street.

Correspondence

From a Dry Friend

To the Editor of THE MEDICAL TIMES:

The complimentary copy of the Medical Times, February, contained an article which is a great disappointment to me, "Prohibition in Relation to the Physician". I am greatly surprised that a man posing as a respectable gentleman would use such language against our Constitution and Courts. Such efforts to break down confidence in our Courts and deride the Constitution usually come from the low criminal class. Persons who act like another class automatically place themselves in that class. False statements, untruthful interpretations and applications of the Prohibition Law are frequent to say the least. No one can hope to do good who resorts to such methods. The crimes of the slacker, pacifists, or conscientious objector are nil in comparison to the crook who poses as a gentleman of influence and advises people to openly proceed to violate the laws of his country.

Of course you people are more subject to foreign influences than are we in the mid west. However, we have the same right as you, if any, to object to a part of the Constitution that does not suit us and cry out, "Sumptuary law, demigods, bureaucrats, assinine laws may all go to hell,"—we'll get what we want. You know where that spirit comes from.

I graduated from a class A college, been practicing medicine for 37 years, taught in Med. Depart. Ill. U., and I urgently resent your effort to prostitute the medical profession in such an untrue and disgraceful attitude toward law and order.

I voice the mind of a vast majority of physicians in this part of the U. S. when I say we will do all in our power to enforce the Dry Law against all violators. No self-respecting gentleman—nothing but a low red Bolshevic will advise citizens to proceed to break such laws as do not suit them even though written in the Constitution of their country.

You, as Editor, share the unholy infamy in trying to degrade our Country and Courts by circulating such libelous talks as Gillett's.

Very earnestly yours,

G. H. VAN DYKE, M.D.

Winona Lake, Ind., February 3, 1927.

The Arkansas Venereal Clinic

In line with the cooperative program with State health departments in the control of venereal diseases, the United States Public Health Service will give special courses in training to physicians, clinicians and health officers at its venereal disease clinic, Hot Springs, Ark., Surgeon General Hugh S. Cumming has just announced.

Fees are not charged for this course of instruction. The individual physician, however, will neessarily provide his own travel expenses to and from Hot Springs and his living expenses while there.

Interested physicians should write to the local State health officer or to the Surgeon General, United States Public Health Service, Washington, D. C., for information or application blanks. Applications should be indorsed by the State health department in which the applicant resides before being submitted to the United States Public Health Service.

Heart Disease Leads

"Diseases of the Heart" was given as the principal cause of death in the registration area of the United States in 1925, according to an announcement just issued by the Bureau of Census through the Department of Commerce. Nephritis was second, in 1925, displacing pneumonia, which held that place in 1924. Pneumonia took third place, with cancer, tuberculosis (all forms being totaled) and cerebral hemorrhage following in the order specified.

Diagnosis and Treatment

Thyroiditis

H. H. Searls and E. I. Bartlett, of the University of California Medical School, group inflammations of the thyroid gland into the acute, sub-acute, and chronic types. Acute thyroiditis is quite rare in this country, and is most commonly found as a sequel to tonsillitis, otitis media, scarlet fever, pneumonia, and typhoid. The general picture is one of severe systemic reaction developing suddenly with chills, high fever, and prostation. Locally, the gland is enlarged, very firm, fixed, and quite tender. The reaction may remain localized in one lobe, or less commonly, involve the entire structure. The patient complains of severe pain, together with marked pressure on the trachea and esophagus. The process may go on to suppuration, requiring drainage, but more commonly subsides rather quickly under treatment. Exophthalmic goiter may follow an acute thyroiditis, or with extensive destruction of the gland, evidence of insufficiency may develop. There is desquamation of the epithelium lining the acini, disappearance of colloid, and tremendous invasion of the interacinar spaces by lymphocytes and polymorphonuclear leucocytes. There may be small hemorrhages. Thrombosed vessels are noted. The gland is congested and edematous.

Riedel, in 1896, first described a sub-acute inflammation of the thyroid coming on fairly rapidly, causing some pain and marked pressure, and chiefly characterized by an extreme degree of induration. Emphasizing this latter finding, Riedel named it "iron-hard strumitis." The French later applied to it the more commonly accepted term "ligenous thyroiditis." Because of its consistency and fixity to surrounding tissues, it is often pre-operatively diagnosed malignancy. The condition is characterized by a tremendous fibrosis, with absence of colliod and obliteration of the epitheilal cells and acini of the gland. This rapidly forming fibrous tissue gives the extremely hard consistency to the tumor. As the new scar tissue develops in the isthmus of the thyroid, it contracts, pulling the two lateral lobes tightly against the trachea, resulting in an alarming sensation of choking. Section of the isthmus relieves this symptom, the elastic tracheal rings causing the two lobes to spring apart. No further surgery is indicated, the patient making a good recovery without excision of thyroid tissue. The records of two such cases are on file at the University of California Hospital. In both instances the possibility of malignancy was seriously considered. In one of these streptococcus viridens was cultivated from a small section removed from the isthmus. An identical organism was obtained from the patient's throat.

Under the heading of chronic thyroiditis, tuberculosis and lues must be given brief mention. Tuberculous thyroiditis is a common incident of miliary tuberculosis. However, as a primary condition it is extremely rare and is very difficult of diagnosis. Mosiman, in 1917, gave an excellent report of nine cases. None of these had been correctly diagnosed before operation. Their true nature was found only after careful pathological study. Seven had been clinically diagnosed exophthalmic goiter. Two had exophthalmos. These nine cases represented less than 1 per cent of available material.

Syphilitic thyroiditis, always a rare disease, has, under the rationale of modern anti-luetic treatment, become an even less frequent finding. Here again, malignancy has been usually considered and diagnosis only obtained by histologic study or by response to treatment for concomitant lues.

A third type of chronic inflammation—a diffuse thyroiditis of non-specific etiology—has been made the main basis for our investigation. In exophthalmic or hyperplastic goiter, cells of the lymphocytic series are an acknowledged part of the pathologic picture. Such "round cells" may be grouped in follicles or scattered between the acini. When the infiltration is more advanced and is associated with desquamation and fibrosis, the picture becomes, in part at least, that of a chronic thyroiditis. At times the chronic inflammatory reaction is so advanced as to dominate the picture, and we find no evidence of accompanying hyperplasia. This condition, a true diffuse thyroiditis, is very difficult of diagnosis. Thus, of seventeen such cases selected for their typical pathological picture from the files of the University of California Hospital, only three were correctly diagnosed preoperatively, the condition in eight being called toxic adenomata, and in the remaining six, hyperplasia.

Because of this high percentage of error in diagnosis, a careful study of the case records of these patients has been made in an effort to determine any clinical points of differentiation which might aid in establishing pre-operatively the true nautre of the pathological condition.

A second series (20 cases) in which the pathological picture was that of hyperplasia, with an associated chronic thyroiditis, was also analyzed from the standpoint of the clinical picture in an endeavor to establish grounds for a secondary diagnosis of in-